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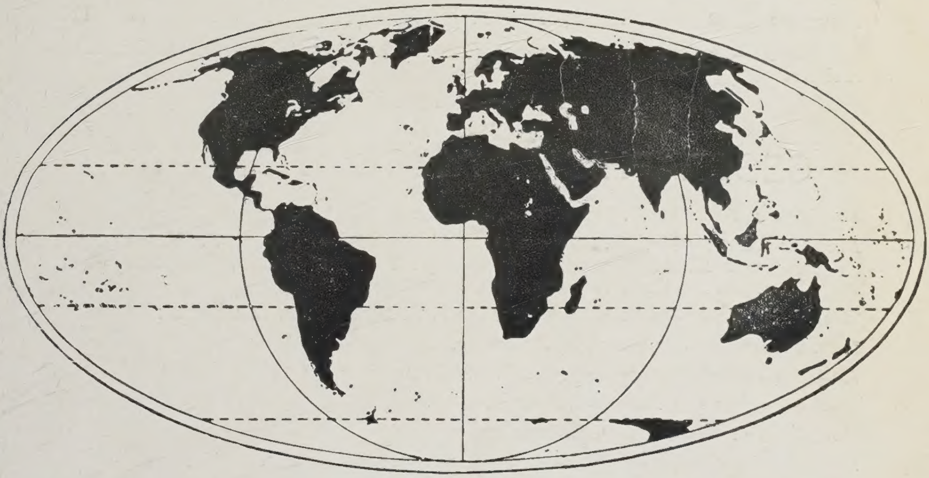
GEOGRAPHY

FORMERLY THE GEOGRAPHICAL TEACHER.



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CONTENTS

Page

SOME THOUGHTS ON PRESENT-DAY TEACHING OF GEOGRAPHY IN SCHOOLS. Address to the Geographical Association. L. Brooks 63

THE PLACE OF GEOGRAPHY IN AFRICAN EDUCATION. F. Musgrove .. 71

THE PETROLEUM INDUSTRY OF THE LOWER THAMES AND MEDWAY. B. E. Cracknell 79

THE INDUSTRIAL DEVELOPMENT OF LOWER THAMESIDE. J. Bird .. 89

THE LATER DEVELOPMENTS IN HERBERTSON'S THOUGHT. H. J. Fleure 97

OBITUARY 104

GEOGRAPHICAL ASSOCIATION 107

REVIEWS OF WALL CHARTS AND FILM STRIPS 109

REVIEWS OF BOOKS 115

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SOME THOUGHTS ON PRESENT DAY TEACHING OF GEOGRAPHY IN SCHOOLS

ADDRESS TO THE GEOGRAPHICAL ASSOCIATION

Leonard Brooks, M.A.
President, 1951

I FOUND it very difficult to decide what should be the subject of my presidential address. For a long time I toyed with the "British Commonwealth in the World of To-day"; but I thought that a president who had spent 15 years as a teacher and 26 years as an inspector of schools ought to discuss a topic connected with the teaching of our subject in schools. Looking back over 45 years' connection with the Association it is interesting to notice how each generation brings up problems of very much the same type. If you want to be really up-to-date you should read a pamphlet called "Geography in Education" published 33 years ago by the Association. It gives the conclusions reached during the first Ministry of Education summer school for geography teachers held at Aberystwyth under the direction of Professor Fleure in 1919. The things we discussed then seem to have come round again full circle.

Therefore, in my address I shall make no pretence of setting out new ideas or advocating revolutionary changes. What I am going to say I have said many times before, but I think it worth repeating. *First*, I want to show as clearly and simply as I can, why we teach geography as a separate subject and object to merging it in a hotchpotch of several subjects; and what, in my view, should be the guiding aim which should be achieved by the end of the school course. *Secondly*, I wish to deal with some practical matters in carrying out our aim.

Since our gallant struggle for the better recognition of our subject, which sometimes I think we won rather too easily and perhaps before we were ready for rapid expansion, we have become used to important reports, such as the Hadow and Norwood reports, proclaiming that geography should be one of the principal subjects of the curriculum. Of course, we agree, but why should it be so regarded? Is it because of its utilitarian value, its value in commerce and to the general reader? These *are* important and we should not underrate them. The claims of geography, as must the claims of other subjects, rest on whether or not it has an indispensable contribution to make to the needs of the educated citizen of to-day, and whether or not this contribution is of such a nature that it can be presented to children of school age. Geography has not always made this indispensable contribution and it does not always make it to-day.

Why has our subject made enormous progress in the last 40 years? I consider that this is entirely due to the fact that it has developed (*a*) *coherence of content* (it is not bits of many subjects) and (*b*) *characteristic methods of presentation.* Now under what conditions does the teaching in the classroom make its proper contribution ?

It is clear that any sort of teaching won't do. It must have *coherence of content* and *the geographers' characteristic methods of presentation.* In my view these will be achieved, and the subject will make its proper contribution to the school curriculum, if we make it our main objective to train our pupils accurately to imagine how people live, move, and have their being, *to-day,* in the different countries and regions of the world ; and to show how their lives are related to the physical and other conditions of their environment, to the lives of others, and to the past. This was the aim for geography in school arrived at during a meeting some of us had with Mackinder at Birkbeck College during the first world war.

Geography taught from this point of view *has* coherence of content and develops characteristic methods of presentation. What *is* the supreme test of good geography teaching in schools ? Surely, it is that the teaching brings to one focus three elements which, as Professor Roxby said at that 1919 Summer School at Aberystwyth, again and again appear in most problems confronting us. These three elements are :

(I) The personality and possibilities of a region ;
(II) The characteristics, the needs, and the outlook of the people ;
(III) The nature, requirements and effects of their work.

These are the Place, Folk and Work of Professor Geddes. These elements are not taught separately, each for its own sake only, but, according to the age and attainments of our puils, in their inter-actions and inter-relationships.

It is in the handling of the elements, Place, Folk and Work, that the skilled teacher is seen and it is the synthesis of these three that drives the teaching on to a regional basis. I think there can be no doubt that in the school courses *as a whole* the emphasis should be on *man* and the method should be to study human experience regionally. I don't mean that systematic regional geography should be taught at all stages, but the regional synthesis should be in the teacher's mind and should be expressed in the handling of lessons and also in the choice of topics for the syllabus whether that be Things Seen in the Shops, Journeys about the World, the Commodities of Commerce or Children of Other Lands ; of course this test does not apply where skill in using an essential tool is being acquired, e.g. the reading and interpretation of maps.

This study of man in relation to his environment inculcates two very valuable habits of mind that are characteristically geographical and were expressed by Professor Roxby as :—

(I) The habit of picturing a region or a country as a whole, made up of related parts ;
(II) The habit of viewing human life in any particular region as an evolution.

I *know* that *by the end of school life* these habits of mind *can* be acquired by most of our pupils. They cannot be acquired if geography is merged in what is called Social Studies, and this is my very strong objection to such a course. The physical basis is practically eliminated in Social Studies and the study of man and his work degenerates into a mass of bewildering local Government details. Coherence of content and a training in the geographer's way of looking at things disappear and the merits that gained for our subject an indispensable place in education are jettisoned. Of course, no one attempts to teach geography or any other subject in isolation. Indeed, the geography teacher makes more contacts with other subjects than any of his colleagues.

The above habits of mind inculcated by good geographical training are of immense value to all good citizens even if they leave school at 15. Six years later they become full citizens and voters. Think of the many problems of home, commonwealth, or world importance upon which our citizens of to-day would be better informed if they possessed these habits of mind. A housing scheme, a road scheme, new towns, self-government problems, the future of the Colonial Empire, the colour problem in Africa, the problems presented by increasing population and food shortages, the problem of Russia, Egypt and Persia—what a lot of them there are to-day !

I don't advocate that difficult political and other problems should be taught *as such* in the classroom, but that our girls and boys should be so taught that *by the end of the course* they understand something of how people live in the different regions of the world, how their life is related to the lives of others and how, in sickness and in health, even in wars and tribulations, we are all members one of another. Heaven knows there is need of such teaching.

We have had two devastating world wars in a single generation. Every country in the world was directly or indirectly concerned. To-day the world is, in effect, a much smaller place than it was. The *Mayflower* took 100 days to cross the Atlantic, the *Queen Mary* does it in 4½ days ; aeroplanes do it every day in a few hours. As I speak the Prime Minister is crossing the Atlantic and is in constant telephonic communication with Government Offices. For nearly 3 years we have been in constant communication with an expedition now in the Antarctic. A photograph of the expedition's headquarters has been radioed to England and published in the " Times." How different matters were less than forty years ago. Captain Scott and his comrades reached the South Pole in January, 1912 ; their bodies were discovered by the relief party in November, 1912 ; the news of the disaster was received during an evening meeting of the Royal Geographical Society on 10th February, 1913, more than a year after they had reached the Pole. A fortnight ago at the Royal Geographical Society the lecturer held a conversation with two Swedish engineers at a new hydro-electric installation north of the Arctic Circle. Everyone in the hall heard the conversation. This generating station is underground and some of its current goes south the whole length of Sweden, goes under the Sound and is used in Danish towns and farms. If there had been a Channel tunnel, cables would have been laid along it to bring to Britain electric power generated in the Alps. Yes ! the world is a much smaller place than it was.

Mackinder taught us that never again can any important act occur in any part of the world and be isolated there. We have jumped very quickly from being citizens of Britain and the British Commonwealth to citizenship of the world and we have *not* realised the implications of this, as present day conferences show. I do so want to bring a broader and daintier spirit into our geography teaching ; something, as Professor Fleure once said, of the spirit of St. Francis of Assisi. Too often we think of other lands from the point of view " What can we get from them ? " " What ought they to buy from us ? " Not so often do we ask " What is their characteristic contribution to the life of the world ? " " What can we and others do to help ? " If in our personal relations with others we were always to think in terms of " What use is so and so to me ? " what a lot of useless people we should find ! But if we turn it round and think " What can we do for him ? " we find ourselves in another world at once.

I hope in all I have said so far it is clear that the aim of geography teaching in school should not be expressed as "to train pupils to be good citizens of Britain, the Commonwealth and the world." This leads to woolly teaching. Besides, this is equally the aim of teaching all school subjects, even mathematics. The aim of geography teaching is to teach geography and we are fortunate in having a subject of such a nature that, when properly interpreted, is indispensable in the educational make-up of citizens. The development of a balanced and objective outlook through sound geography teaching is the geography teacher's best contribution, not only to the make-up of the educated citizen, but also to the solving of problems of international relations.

I wish to make a second, somewhat similar point. In school we should beware of splitting up our subject into " adjectival geographies " appropriate to the university stage. In sixth forms the beginnings of specialisation appear, but below that we don't teach physical geography, economic geography, historical geography, biogeography, or even human geography, as these are defined by the British Association Committee, for their own sake : we teach geography as a unity. In grammar schools it is possible, and even attractive, to plan the five years' course giving a bias at different stages to the physical basis or the elements of climatology or of economic geography always provided that these are not emphasised in isolation from human geography, and that *before* the end of the course the teaching is based solidly on geography, without any adjectives.

I have taken longer than I intended over this first part of my address. Now I must turn to some observations on the organisation and conduct of our subject.

First a few words about syllabuses. The drawing up of a syllabus is the duty and privilege of each school. I have always refused to draw up a syllabus for anyone. My line was always " Draw it up yourself and then I will try to make comments."

Most syllabuses I have seen are much too full, and contain far more work than could possibly be carried out in the time allowed ; and this is not got over by including some such comment as " The teacher will select from the following." I have met many teachers who took great pride in telling me that they never covered their syllabuses. We must face our task squarely and confine our syllabus to what we can get through and adequately revise. We might proceed on these lines. There are 52 weeks in the year. Take off 12 to 14 weeks for holidays : call it 12 as we are in London : that leaves 40. Take off 6 for interruptions, e.g. swimming, sports, etc., that leaves 34. Suppose there are only 2 lessons a week, though there should be 3 in the last two years of the 5 years' course and 6 in the sixth, and we have 68 lessons to provide for in the year. That is 68 40-minute lessons, not lectures, and, therefore, a point I shall make later, 68 times 20 minutes for expounding new materials. Suppose the syllabus is " The Three Southern Continents," and you give 22 lessons for each, the problem now is to select the topics which can be covered in the time and make them the syllabus. This would be a real syllabus which could be covered and organised into knowledge. If anyone comes along and says, " Rather thin, isn't it, teacher ? " just smile and ask the questioner how it could be done better.

If the teacher knows the syllabus, why should the pupils not know it, too ? I have been delighted to come across several schools where the first thing entered into pupils' note books at the beginning of each school year was the syllabus. Pupils as well as teachers should know how the work is progressing.

What I have said about syllabuses can also be applied to individual lessons. It pays to have a clear objective, a text, as Mr. Fairgrieve used to call it, for every lesson, and to see at the end if it had been fulfilled ; and if not, why not ? It also pays to be quite certain that pupils have mastered what has been taught. This may seem very obvious and elementary, but I know how indifferently it is often done. When I had the joy of teaching girls and boys I never believed they had understood what I had told them until they had told it back to me in one way or another. Suppose in a lesson you had taught what an isotherm, or a contour line, or the Equator is. Next time you see the class give out pieces of paper and ask them to tell the truth, the whole truth and nothing but the truth about one of these things, that is, see whether they have understood and can define accurately. You may get a shock when you read the slips. As moderator at one time or another in the three biggest of the school examining bodies, I know how very many 5th and 6th form candidates fail to define even the simplest things. Pupils really do need to be trained in such matters.

Before leaving the subject of syllabuses I want to say a few words about primary schools. Of course, there should be no formal teaching of geography in infant schools although I have actually heard a lesson on map projections in an infant school. Geography should not appear in the time-table until reading ceases to be with tears. The only point I want to make about the junior school syllabus is that it should not be planned from the standpoint of what secondary schools would like the children to know at 11 plus. What is done between the ages of 7 or 8 and 11 must meet and must satisfy the needs and interests of children of that age. The same applies to grammar school syllabuses. No stage of education should be regarded merely as a preparation for the next. In other words laying up treasure in heaven is not a sound educational maxim for syllabus making. The junior school age is the stage when children are interested in strange scenes, in the wonderful things in the world, in journeys by land, sea and air, in animals and living things, in things seen round about their homes and school. The skilled teacher uses these things as interest tags and builds up his syllabus accordingly. He also illustrates his lessons by a wealth of visual aids for this is the stage for giving accurate impressions ; it is also *not* the stage for bothering too much about cause and effect relationships.

My next topic deals with a more practical way of teaching in the ordinary classroom or even in the geography room. If you had heard as many geography lessons as I have you would be impressed by the fact that far too much talking goes on. One of our chief needs is to develop ways of practical teaching in the classroom. Of course, any teaching that relates to the practical affairs of life is practical in the widest sense, but at the moment I am thinking of pupils doing things, of introducing more activity into lessons, of throwing more of the onus of learning upon the children themselves. Suppose the average lesson is 40 minutes. In general (there will, of course, be many exceptions), is there any need for the teacher to talk more than 20-25 minutes ? The rest of the time could be spent in preparation, following up, mapping, etc. In passing let me say that only very rarely should pupils copy notes from the board, and with regard to notebooks these can always be praised or condemned by whether or not pupils are being trained to record things in the geographer's characteristic way, i.e., by maps. A lot of writing gets into note books or files that could be much better expressed in maps. Some schools, even modern schools, make their own text-books, and I have seen some most excellent examples of these. The point I am making here is that in most lessons the pupils should have something to do.

Another way of introducing more work by the children themselves is to organise projects. Too much geography teaching is general in character. The world is a big place and there is so much to cover. In each year, perhaps in each term, if I were back in school, I should correct this general teaching by setting aside a number of lessons for special projects dealing more fully with selected topics or areas. These projects would, of course, appear in the syllabus. For example, with a class studying the British Isles there would naturally be some concentration on the local area, but in addition to this I should select some other areas or topics, preferably known to me at first hand and of which it is possible to get plenty of teaching illustrations of all kinds. Then instead of disposing of such an area or topic in one lesson I should spend 2, 3 or 4 weeks on it. Thus with the British Isles I might take the Lake District ; farming in East Anglia ; cotton manufacturing in Lancashire. With North America I might choose the work of the Mississippi ; the T.V.A. ; or wheat growing in Canada. I should do this kind of thing at all stages with beginners as well as with sixth forms. I am convinced that it is a mistake to keep in " the broad outlines " stage all the time, because such teaching rarely gets to grips with real people and real situations ; and I am equally certain that it is wrong to do the opposite all the time, because, for example, you cannot leave with your pupils a true picture of the United States if you spend all the time on actual examples of life in three, four, five or even six areas. You need an intelligent mixing of both types of treatment.

Now I must turn to another point of method. I think there is far too much straight-jacketing of lessons into a logical order—position, size, physical features, climate, natural vegetation, arable and pastoral farming, minerals and manufacturing, communications, cities and ports. This is often arid, artificial and unreal. How people actually live in the area comes only at the *end* of a series of cause and effect relationships. It is much better, especially in modern schools and in the lower and middle forms of grammar schools, to begin with an accurate account of how people live and work in the area under discussion. Then, according to the age and attainments of the pupils, we may enter into the reasons—physical, historical or economic. We should vary our methods, e.g., on beginning a new continent or country the first lesson might well be an examination of a map showing the distribution of the population. The rest could easily be based upon a series of problems for solution. In the case of a whole continent, I think lessons on the relief, climate, rivers and the like come best as revision and " pulling together " lessons at the end.

Now let us turn to another matter. I think we should all agree that in all types of schools the teaching of geography should be closely related to the immediate interest and environment of the pupils. Yet local geography is probably the weakest part of geographical teaching in schools. No school can get out of this whether situated in the centre of London or surrounded by farmlands. If there were time I could tell you of first-rate local geography by schools in Lambeth, Westminster (Covent Garden), Battersea, Hammersmith and other parts of London. If we don't give our pupils first-hand experiences of geographical principles and phenomena how can we expect them accurately to imagine these things applied to far distant lands ? Throughout the course principles and experiences learned at first-hand must be woven into the texture of the teaching.

This means a well-planned and graded series of educational visits of half a day or a full day as integral parts of the syllabus. These should be prepared for very thoroughly and experiences gained should be consolidated in subsequent work at school.

From educational visits we naturally come to School Journeys lasting a fortnight, although a week is better than nothing. If I had my way every school child would take part in at least one school journey during its secondary school life. I shall never forget meeting a party of girls from North Kensington in the Isle of Wight. There were 40 of them and all were 14 years of age. On the day they arrived I went to the sea shore with them, and on the way 12 saw a live cow for the first time ; 22 saw the sea for the first time. They had been taught geography for 6 or 7 years ! I need not say more. The big point is that we should use every possible means of bringing personal experience and reality into teaching. We must bring the world outside into the classroom and take the children into the world outside. Bring the postman, the fishmonger, the medical officer, the town clerk, and the surveyor into the classroom and let the children question them. Take the children to the docks, the Town Hall, the markets, the farms and workshops.

Perhaps, in this connection, you will allow me just to draw your attention to the advantages to be gained by joining the British Ship Adoption Society, of which I am one of the four founders. I am also quite certain that many geography teachers don't avail themselves of the many facilities offered by the Imperial Institute of which I am a governor. In passing I should like to make known a service which the Institute proposes to make available to schools in Greater London next July. Now that some external examinations are held earlier, fifth and sixth forms in grammar schools have more free time towards the end of the term. It is proposed to hold two conferences, one of perhaps two days' duration to consider African problems, and one lasting one day only to consider food problems of India and Pakistan. There will be talks, discussion groups, films and so on. If such meetings are successful there is no reason why they should not also be arranged at convenient centres in the provinces. The Imperial Institute now comes under the Ministry of Education, and Sir Harry Lindsay and his Governors are most anxious to extend its already very considerable services to schools.

Lastly, do not be afraid of experimenting, even in the organisation of the time-table, which I suppose chiefly concerns head teachers. In these days of subjects fighting for a place in the time-table why not have courses in some subjects for only part of the time ? There is no regulation to say that *all* subjects must be taught *all* the time. One grammar school I know, in each of the first four years takes geography for six months, then drops it and takes history for the next six months. I have tested the results very carefully and am quite sure that more is done in 6 months of 6 lessons a week than in 12 months of 3 lessons a week. Moreover, after a rest the pupils seemed to come back to geography or history with increased keenness. In the fifth year, the year of the first examination, each subject had 3 weekly lessons. I don't say " Copy this," but I do say " don't be afraid of experimenting in syllabuses, methods or in any aspect of the work."

I have no time left for other things. Let me end by saying that whatever else you forget or reject hold fast to what in the first part of this address I tried to gather round " Place, Folk, Work." Let your teaching inculcate sympathy, understanding and appreciation of others. Make its aim—and I make no apology for repeating this, because I know that the essence of good teaching is to understand that things to be remembered have to be repeated more than once or twice—make the aim of your teaching so to train your pupils that by the end of the school course they are able accurately to imagine how people live, move and have their being, to-day, in the different countries and regions of the world, how their lives and work are related to the conditions of their environment, to the lives of others and to the past, and how in sickness or in health, in spite of disappointments and misunderstandings, regions and people must get closer together as the days go by.

THE PLACE OF GEOGRAPHY IN AFRICAN EDUCATION

F. Musgrove*

THERE is surprising unanimity among educationists as to the importance of geography in African education. Julian Huxley in *Africa View*[1] urged that geography and biology should form the core of the African school's curriculum, and his argument was reinforced by the De La Warr Report on Higher Education in East Africa (1937).[2] The case for an emphasis on geography teaching is very strong in an age which Lewis Mumford describes as " biotechnic," when the human and vital studies are receiving the attention previously enjoyed by the mechanical sciences. In Africa, where the facts of geography are even more decisive in human life than in more controlled environments, the case for giving prominence to geography teaching is compelling.

Although there is general agreement about the importance of geography as a school subject, there is less agreement about its content and presentation. To a greater extent than the teacher in England, the teacher in Africa needs to consider the ultimate social purpose of his work. He is engaged in a revolutionary task which must be undertaken responsibly in the light of a carefully considered educational philosophy. In the geography lesson he must ask whether his aim is to teach his pupils to think like geographers, to submit themselves to a discipline of facts and preserve an academic neutrality over the social implications of the study, or whether his purpose is primarily sociological and his intention to underline the " lessons of geography " for the local society. And he must consider whether these are in fact irreconcilable alternatives, or whether he can teach a factual discipline which does not exclude all sociological content.

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* Mr. Musgrove is an officer of the Colonial Education Service, and writes from Fort Portal, Uganda. He wishes it to be clear that any opinions expressed are his own and should not be regarded as stating the policy of any Colonial Government.

[1] Julian Huxley, *Africa View*, London, 1931.

[2] *Report on Higher Education in East Africa*, commissioned by the Secretary of State for the Colonies, H.M.S.O., London, 1937.

There can be no doubt that geography has an important rôle in teaching a respect for facts. A people without a written tradition has great difficulty in verifying facts which are distant in time or space, and consequently tends to be unduly credulous. And where racial feelings are engaged, factual evidence is only too often an irksome irrelevance. Thus the geography teacher may have difficulty in proving that the local human and cattle populations have increased in the past few decades since racial outlook demands the belief that the European has consciously reduced the numbers of both cattle and people in order to ensure White ascendancy. We must be prepared for such views without undue surprise. William Cobbett in England denied precisely such facts in obedience to his political convictions.

One important aspect of the factual discipline is the habit of classifying and organising facts, and this is admirably developed in close geographical studies. It is, I believe, because of the unorganised condition of his new knowledge that the African often appears unable to reason clearly. He must learn the great lesson first taught by the Greeks, that classification is the necessary basis of thought.

Geography is pre-eminently the subject in which pupils can develop the power of reasoning, in which they can learn not only the facts but also how to establish relationships between them. Teachers in diverse African territories have found in their pupils an inability to deploy knowledge, to release it from the context in which it was originally learnt. But geography is a hybrid subject in which knowledge derived from other traditions can be thrown into new combinations ; new relationships can be drawn from the knowledge gained in the science, mathematics and history lessons. A plant or insect studied in biology does not exist *in vacuo*, but has a geographical background closely related to its needs ; the geometry of the circle is valuable not only in solving riders but in understanding the movements of the earth and finding solutions to simple problems of navigation ; Fort Duquesne of the history lesson is not only a stronghold attacked by Braddock but the origin of the modern Pittsburgh. There should be the closest integration between these subjects, with geography as a great galvanising field in which facts which may have fallen inert in other lessons are touched with life as they are brought into relationship with other fields of knowledge.

It is unfortunately true that geography is often a popular subject with African pupils for the very reason that this is not attempted in our teaching. It is still possible to pass the School Certificate examination quite well by answering questions of the definition type, which ask for items of unrelated fact. " What do you understand by the following : coral atoll, meander, etc.," and, "On the blank map provided mark a valley floor, dip slope, etc.," are questions of the type on which a candidate can still score a sufficiency of marks without being required to re-handle the facts and make inferences from them. History is a less popular subject because it more often requires an effort to establish relationships between facts, to put them in connected sequence, or to draw out causal connections. Yet geography lends itself readily to questions of this type, and an exercise which requires the pupil to explain the relationship between climate, vegetation and the distribution of population provides a valuable training in the use of facts.

In a well-integrated school curriculum, with geography as the core, there is ample opportunity to give facts a deeper reality by seeing them in the perspective of the different intellectual traditions. The new western knowledge is often unreal for an African pupil : it needs to be buttressed on all sides with related evidence. A great deal of the knowledge gained in the physics laboratory can, of course, find a new application when the geography lesson deals with climate and elementary meteorology ; the activities of Hudson's Bay Company are not of such purely antiquarian interest when they are established as the background to Canada's present-day fur trade ; the racial problems which underlay the Great Trek, which are dealt with in the history text-book, will come into clearer focus when, in geography, we examine the modern distribution and composition of the South African population.

Geography occupies a strategic position in the great drive which must be made in all African schools to build up a truly scientific attitude to man and the world : it will confirm the naturalistic account of the universe given in the science lessons. A poor crop yield is interpreted in terms of climate and the properties of the soil, and not the result of a sorcerer's spell ; storms find an explanation in terms of thermal currents and not in the displeasure of a tribal god.

The difficulties which the geography teacher faces in attempting to build up such an attitude are formidable. By the time the secondary school pupil is being taught geography on the western model, he has a considerable body of ideas to unlearn. He was probably not introduced to the notion that the earth is a sphere until he was in Primary IV, aged eleven or so, and then, perhaps, unconvincingly by a vernacular teacher who did not understand or believe the explanation anyway. At the School Certificate level he is still unconvinced though he will reproduce the stock answers for examination purposes. An African's view of the world has usually been shaped by his mother's stories (one generation of educated women would transform the outlook of Africa), or by the Ancient Hebrew cosmology taught with all the weight of western prestige by the Christian Missions. The geography teacher is faced with a most difficult obstacle in either case.

The teacher must always remember the great jump he is asking his pupils to make in accepting his account of the earth, its origins and rock formations, its movements and position in space. Underlying our western interpretation of nature are views of causation and inertia which are comparatively recent and represent a great jump in human thought. It was only when men began to ask, not, *Why do bodies move ?* but, *Why do they stop ?* not, *What keeps them moving ?* but, *What causes a change in their movement or state of rest ?* that the answers of Newton were possible. Even as late as Galileo, western thinkers were puzzled much as African pupils are puzzled to-day. Although Galileo argued the rotation of the earth, his " proof " was based on a gigantic mistake ; yet it was the sort of commonsense evidence that African pupils demand, namely, that the motion of the tides is evidence of the double rotation of the earth on its axis and round the sun. The ideas of Newton represented a great leap forward in human thought, not a continuous development in a straight line. We should always remember that we are asking the African to make this jump without long centuries of preparation. The best minds from the time of Aristotle until the seventeenth century could not conceive of motion without a physical propelling agency, or of a body in space without a physical agency holding it up ; and the new interpretation did not come from newly discovered facts, but from a mental transposition in looking at the old ones. This is precisely the African's difficulty, and the teacher will be confronted with it repeatedly through large parts of the geography syllabus.

The African's culture has not predisposed him to accept as uncritically as an English schoolboy the pronouncements of science, and the teacher will have to prove every inch of his way. This is not easy. The forces introduced by Newton were held by the followers of Descartes to be a re-introduction of occult properties into matter which could operate across space between bodies which did not touch. We must not be surprised if the African finds difficulty in accepting our scientific explanations and sees no valid distinction between Newtonian forces and the action of a spirit inhabiting a rock. It is in view of these difficulties that I believe that the teaching of physics is more important than the teaching of biology. It is a necessary background to our geography. Physics and geography must acquaint the African with the idea of order in nature and human affairs, of human activities closely welded to demonstrable natural circumstances and not the sport of arbitrary and occult powers.

We delude ourselves, however, if we think we can stop short at teaching simply a factual discipline in our geography lessons. Even if it were desirable to achieve only this, inevitably we do much more. We teach a method of analysing our entire environment and experience.

The geographer's facts are less objective than he usually claims. Facts are answers to questions which have been asked at least by implication. Geographical facts are answers to geographers' questions about man's environment and his life in it. To select facts is to pass judgment on them as important, to classify them is to select the features judged significant which they have in common. A central

African tribesman might ask quite different questions about his environment and select quite different aspects of it as being important. Like the astrologers of our own past, he will not ask, *How and why do heavenly bodies move?* but, *What significance has their apparent movement for human life?* He is unlikely to have gained our own highly sophisticated release from anthropocentric thought. He has not separated geographical from religious knowledge. Thus the geographical notions of the Bambara of the French Sudan [3] are given significance in many apparently unrelated spheres of life. Comparatively sophisticated geographical ideas, which can be expected of desert peoples, are closely compounded with religious myths in a most complex manner. The Bambara and the Dogon represent the observed motions of the sun, both diurnal and annual, by a zigzag; variations in the form of the zigzag indicate the precession of the equinoxes and the varying length of day and night. But these representations of the ecliptic are more than mathematical symbols: they are an integral part of the life of the people. The zigzag appears in agricultural techniques, in decoration and dances, and in all the ritual of religion. "*L'idée bambara et dogon d'écliptique . . . se relie à une synthèse intellectuelle, à une vue d'ensemble de l'univers et des grands phénomènes de la nature que les Noirs ont essayé,* mutatis mutandis, *de mesurer et d'expliquer.*" (Zahan). These Sudanese peoples see the universal rhythms of earth and heaven repeated in all the activities of man.

African peoples arrive at such ideas because they are not asking the geographer's questions. Many of the people of Ankole in the south of Uganda often explain day and night in the following manner: The sky is held up by a little old woman, and each morning the sun is created in the east by Ruhanga (God). The sun travels to the west where it is eaten by the little old woman, and she throws back a bone to Ruhanga. He uses this to create a new sun which he launches into the sky the following morning. The Banyankole have not asked the question, *How do day and night come about?* but, *How could we, or creatures like us, make day and night come about?* In relation to the questions which he has asked at least by implication, the African's cosmology is sensible. A fact is part of a question and answer complex, and is sensible only in relation to the question. We cannot expect a people to have the same facts as ourselves when they have been asking quite different questions. We must teach the African not only the facts but the questions of geography.

Our geography teaching will thus reshape the attitude of Africans to their life and world. There is a strong case for doing this wholeheartedly, and giving our teaching a marked sociological content. It is in geography that the natural and social sciences meet and gain illumination from each other. A wide range of social studies finds a place in geography, questions of government and economics arise naturally in geography teaching : the African pupil makes them part of the syllabus even when they are officially excluded.

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[3] See D. Zahan, "La Notion d'écliptique chez les Dogon et les Bambara," *Africa*, vol. xxi, No. 1.

The Norwood Report (1941)[4] on the Secondary School Curriculum in England strongly recommended the teaching of civics and some economics incidentally to history and geography, and not as distinct subjects. This, I believe, applies with even greater force to African schools. Although we need to classify our knowledge, there are limits we should set ourselves in presenting new categories of facts and questions to Africans. Most African peoples are still living in a comparatively unspecialised world, they do not break up experience or human occupations into the many specialised compartments which we find useful. As far as possible, and except where such a policy is a definite hindrance to clear thinking, we should work through his conception of the relative unity of experience. It is the African himself who refuses strictly to delimit the subject matter of geography and raises in the geography lesson questions of wide social application.

Geography is the meeting ground for all the major problems which beset Africa to-day, but these will be illuminated not by confining our attention to Africa alone. There is a regrettable tendency, reflected in the School Certificate syllabuses, to contract geographical studies to the confines of the African continent. A geography which deals exclusively or even mainly with Africa will be made less and not more African, for Africa gains meaning from her similarities with and points of divergence from other comparable land masses. Characteristically African problems are seen clearly only against a background of world geography. (It is singularly unhelpful to base the geography syllabus on a non-geographical classification such as the Colonies and Dominions of the British Empire). Thus the problems of African transport, which have kept Africa so long isolated from the world, will be understood fully only against an examination of the opening up of other continents and the physical and climatic conditions which made the work comparatively easy.

In such comparative studies the peculiar difficulties of the African continent will receive definition and, perhaps, the tentative outlines of solutions. The economic geography of America or Australia leads directly to the most pertinent African questions. In discussing why America is rich, in describing the part played by foreign capital in the development of the new continent Australia, inevitably the nature of wealth and capital come up for closer definition and Africa's condition and needs are assessed in the light of such knowledge. There is widespread evidence of a deep interest in economic matters amongst educated Africans, and a keen interest in the possibility of starting companies. West Africa is notoriously the land of the trader (although observers have detected surprisingly little exchange of goods beneath the market's impressive bustle). In East Africa economic ambition is often expressed in the desire that Africans shall displace Asians as shopkeepers, and economic theory stops short at the belief that the more African traders there are the greater will be the territory's wealth. Countries only recently introduced to a money economy and large-scale industrial techniques suffer from many strange delusions which provide a fertile breeding ground for misplaced suspicions. Racial tensions are frequently grounded in bad economics. The mistrust of foreign capital is as deep as the conviction that wage rates are fixed according to colour and bear no relationship to efficiency and work done. And we must not be surprised if an untutored people does not see, for example, that social services are an expression of surplus wealth but is convinced, on the contrary, that schools and clinics can be multiplied without limit save that imposed by racial discrimination.

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[4] *Curriculum and Examinations in Secondary Schools*, Report of the Committee of the Secondary School Examinations Council, Board of Education, H.M.S.O., 1943.

Through a well-considered geography syllabus the African can gain a more accurate and wholesome view of his society's condition. The process of capital creation and the function of saving will be explained when studying the economic geography of the U.S.S.R., the problems of population when studying India. Until such studies are undertaken we must expect the African to measure wealth by counting the heads of cattle or goats, even though the measurement gives little idea of their true economic value and may, in fact, indicate gross overstocking. His error is no greater than that of the eighteenth century mercantilist who equated wealth with the stock of bullion ; indeed economists from Adam Smith to Mill saw wealth as an accumulation, something fixed, a view quite natural in an age when wealth still lay chiefly in land. Our modern view of wealth as a flow was formulated only when industrial production was seen to be the main source of wealth. Colonial Africa is fast entering the world of modern economic facts and must be equipped with the theory to interpret them.

But the study of geography can take the African still further in interpreting his place in the world of men and of nature. Geography is essentially a study of man and human geography should remain the real core of our geography teaching. It should provide insight into man's nature, and the geographer must examine the quality of his response to the eternal challenge of environment. That civilisation itself is an outcome of this response is little appreciated by the growing number of Africans who are so earnestly concerned to acquire civilisation. For too many civilisation is something imported with bicycles, or conditions of life which should be created by authorities. It is the paradox of the welfare state, whether in Europe or an African colony, that it tends to obscure the real source of welfare and well-being. There seems to be little understanding, even among educated Africans, of civilisation as a creative effort put forward by communities to meet the problems of their lives in nature.

Historically, Africa has not met this challenge particularly well. If it is true that the use of iron was first invented in Africa, this is simply further evidence that opportunities have not been used to the full. Dr. R. R. Marett has observed that the overall African picture suggests less developed cultures than the environment warrants :

" Africa has a rich flora and fauna, much mineral wealth, and a physical configuration that . . . is highly diversified ; so that it may be doubted whether the natives have reached as high a pitch of indigenous culture as the resources of the environment, considered by itself, might seem to warrant."[5] Anthropo-geography, particularly if it includes some historical geography, as it should, will acquaint the African pupil with a view of civilisation more in keeping with realities. Geographical factors in the early growth of civilisations, the impetus, for example, of the climatic changes after the Fourth Ice Age, notably along the Afrasian steppe belt ; the need for complex social organisation to meet the needs of irrigation systems ; the climatic changes affecting important human migrations, a study of these will afford insight into society's deepest problems.

And yet it is important in teaching Africans, who are widely represented as tending to an undue materialism, that the geography lesson should not leave the impression that man has been fully interpreted in a neat environmental formula. The " apathetic fallacy " betrayed Buckle in his " History of Civilisation in England " just as it was accepted by Ratzel and his followers who saw man as a piece of earth, the most active portion of an intermittent biosphere. It has often been pointed out that such views are somewhat uncritically accepted by educated Africans. Our teaching should not weld man too rigidly to his physical environment, nor lose sight of him amidst the isotherms and isohyets. We shall teach that men of the Asiatic steppe, with wild horses at hand, became horsemen and nomads ; but we must also point to the Red Indians of North America who made no attempt to tame the bison or to avail themselves of the Prairies to develop a similar pastoral life. We may point out, too, that although the Andean plateau produced a complex civilisation, the plateau of East Africa in similar latitudes saw no parallel achievements. There are imponderables in the human situation which evade a naive geographical determinism. The environment which challenges modern Africa is not simply climatic and physical but compounded of many human imponderables. The African is face to face with the intrusion of an alien civilisation. Our geography teaching will end with a question which only the African peoples themselves can answer.

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[5] Marett, R. R., *Anthropology*, London, 1936, p. 119.

THE PETROLEUM INDUSTRY OF THE LOWER THAMES AND MEDWAY

B. E. Cracknell*

LAST year's events at Abadan on the Persian Gulf, and the opening of the £40 Million Esso Refinery at Fawley on Southampton Water in September, 1951, have had the effect of turning public attention to the great expansions of oil refining which are now taking place in the United Kingdom. These developments are part of a concerted programme for all the O.E.E.C.[1] countries of Western Europe which will eventually make them almost independent of foreign supplies of refined oils. The United Kingdom has the largest expansion programme of all the O.E.E.C. countries, and within the United Kingdom the Thames-Medway area is the most important of the five separate regions in which oil refinery development is to be concentrated. The object of this article is to trace the growth of the petroleum industry in the Thames-Medway area from its early beginnings in 1875 to the developments of the present day.

Early Beginnings, 1875–1914 : *Oil Storage Only.*

The commercial production of petroleum dates from 1859 when the first oil-well was sunk in Pennsylvania in the United States. The new fuel was quickly found to be superior to the vegetable and animal oils then in use, or the paraffin-oil derived from certain types of coal shales, and known technically as "Kerosene."[2] Within two years petroleum was being imported into London. The new trade was not popular. Petroleum was known to be a highly inflammable substance and was avoided by the more cautious ship-owners. Sailing vessels were used for the trade, and the petroleum was carried in wooden barrels which did not stand up well to the motion of the vessel during the voyage across the Atlantic. It is not surprising that several serious fires and explosions occurred aboard petroleum-carrying vessels in the confined reaches of the Thames, or that crews for these ships had frequently to be shanghaied. Special precautions had to be taken to safeguard the shipping in the river, and by the Petroleum Act of 1871, Harbour Authorities were required to make bye-laws regulating the trade in petroleum. The Thames Conservancy, as Harbour Authority of the Port of London, duly passed such bye-laws in 1872, which prohibited any vessel laden with a cargo of petroleum from proceeding " . . . . above or westward of Thameshaven," and required that such cargo should be transhipped into specially covered barges at special buoys in the river below Thameshaven for carriage up-river.

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[1] "Organization for European Economic Co-operation."

[2] The words "Oil" and "Petroleum" are frequently used in conversation as if they were synonymous, but it is well to remember that this is not so. The word "Oil" has a very general meaning covering almost any greasy liquid derived from such a variety of sources as Palm Oil, Whale Oil, or Shale Oil. "Petroleum," on the other hand, refers specifically to that particular mineral oil from which the refined product "Petrol" is obtained. Since this article is concerned only with the petroleum industry, no mention is made of the considerable business in the storage of other oil products such as Molasses, or Whale Oil, which is subsidiary to the main petroleum industry in the Thames-Medway area.

When these important bye-laws were passed, Thameshaven was described by a contemporary writer as, " . . . a purely artificial town, or rather village, consisting of little more than railway buildings and cattle enclosures brought into existence by the livestock trade with Holland and North Germany."[3] The name itself was an invention of the " Thameshaven Dock and Railway Company " formed in 1836 with the object of constructing a railway to " a point on the Thames near Shell Haven proposed to be called Thames Haven," where a Tidal Dock was to be built. The scheme was never carried out in full, but a branch line from the London Tilbury and Southend Line was constructed and opened in 1855. The prospectus of the original company had painted the most optimistic pictures of the vast traffic in coals, fish, and livestock, not to mention a million passengers a year, which would pass through the new out-port, but steam navigation, which overcame the difficulties of the meandering tide-way, and the improvements to the river and Port of London which came in the later 19th Century, had killed those hopes, and the only trade which the new branch line could attract was a small trade in live cattle, and a few passengers *en route* to Margate. For a few years, between 1870 and 1876, special legislation following the great cattle plague of 1866–7 gave to Thameshaven a virtual monopoly of the import of live cattle into London, so that for those six years Thameshaven was the most important cattle-landing wharf in the country. Then in 1876 the situation was again altered by even more drastic legislation which forbade the import of live cattle (except for immediate slaughter) from Germany and Holland, the two main sources of imports into Thameshaven. Henceforth cattle from these countries were taken direct to the Foreign Cattle Market at Deptford. Cattle were still imported into Thameshaven after 1876, mainly from Canada, but by this time the petroleum industry was becoming increasingly important, and it was not long before Thameshaven became an oil port handling an annual tonnage not much less than that envisaged by the company prospectus half a century earlier.

The objects of the Thames Conservators in choosing Thameshaven as the limit for the navigation of petroleum-carrying ships were simple. Above Thameshaven the river narrowed considerably and fires or explosions might cause great damage ; at Thameshaven itself the river bank at either side was a desolate expanse of marsh broken only on the north bank by the railway branch line running parallel to the river wall, and terminating at the cattle jetty where deep water came nearest the shore ; below Thameshaven there was adequate space in which ships could wait to unload their cargoes, if that were necessary, without being a danger to other shipping. In accordance with the bye-laws the Thames Conservancy set up a number of buoys at various points in the river where ships were allowed to tranship their cargoes. This was soon found to be a most unsatisfactory arrangement since, if the weather were unfavourable, the process of transhipment might be delayed for long periods or rendered highly dangerous. In these circumstances there was clearly a need for jetty facilities and warehouse accommodation on shore. Thameshaven was the obvious choice, and in 1876, the year in which the live cattle trade with the continent suddenly collapsed, the first warehouses for the storage of barrels of petroleum oil were constructed on the marshes near the cattle jetty by a private company called the "Petroleum Storage Company." The use of wooden barrels was never very satisfactory, and it was not long before methods of carrying and storing petroleum in bulk were being developed. In 1879 the secretary of the new Petroleum Storage Company, in his application to the Commissioners of Sewers for permission to continue the storage of petroleum on the marshes, stresses ". . . the great probability that tanks, and not warehouses, will be ultimately decided upon."[4] By 1880 the change-over had largely taken place, new tanks were being erected on the marshes, and petroleum was being carried and stored in bulk.

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[3] C. G. B. Allen, *The Tidal Thames*, London, 1892, p. 69.

The facilities provided at Thameshaven were so convenient that they were used by all the importers of petroleum ; the buoys placed in the river by the Conservators ceased to be used, and they were removed in 1880. For the next twenty years the Petroleum Storage Company, or the London and Thameshaven Oil Wharves, Ltd., as the company became known in 1900, had a monopoly of the import of petroleum into London. As the quantity of petroleum imported gradually increased (Fig. 1) and more new oil companies were established, so this monopoly became more irksome and was resisted more strongly. The company most affected was the Anglo-American Petroleum Company which had established oil installations at Purfleet further up the river with the definite expectation that the bye-laws would be relaxed to enable ships to discharge petroleum at these wharves. The bye-laws had not been altered and this company was forced to tranship its cargoes of petroleum at Thameshaven. For a few years after 1900 an attempt was made to tranship the petroleum into barges in the river off Southend,[5] but this was found to be too dangerous a method and after several accidents the

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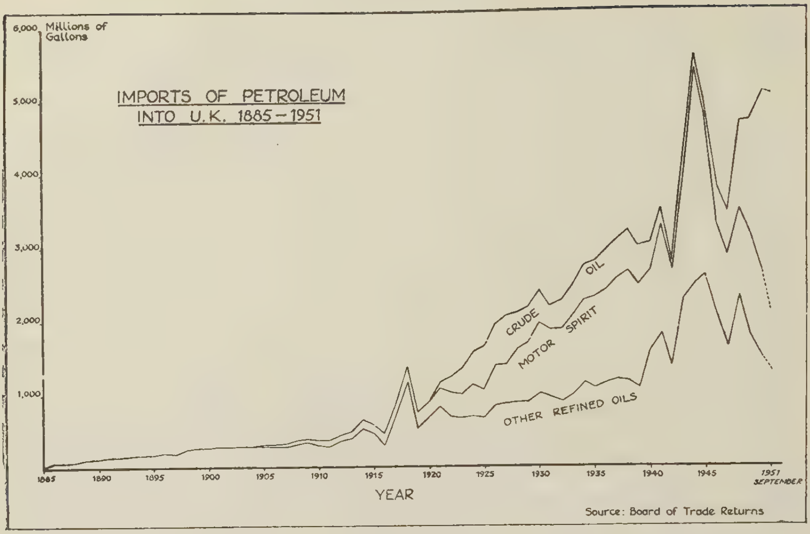
[4] MS. Minutes of the Commissioners of Sewers for Fobbing Levels 1879.

[5] "Consignees must make arrangements either to unload their vessels at the wharves at Thameshaven, or to unload bulk spirit into licensed craft at a point in the tideway adjacent to Southend. This is a very dangerous practice. Vessels are obliged to use their own steam for pumping . . . owing to rough seas it is not unusual for barges to break away . . . one of our own tugs was sunk recently. The process of unloading into barges occupies a period of 8–10 days the discharge often being interrupted by rough weather. After discharge into duly licensed craft consignees, observing certain precautions as laid down, may transport the spirit to the upper reaches of the river. If they elect to discharge their vessels at Thameshaven they are subjected to the charges imposed for landing, storage, and re-delivery." Evidence of Mr. A. Palk, Sales Manager of the Anglo-American Oil Company, before the Departmental Committee on Petroleum Spirit 1910 ; page 113 of Vol. 1 of Minutes of Evidence.



Source: Board of Trade Returns

Fig. 1.

experiment was given up. Between January 1906 and 1914 when the Shellhaven Refinery came into operation, every ton of low-test petroleum which was imported into the Port of London was landed at Thameshaven. Sheltered from possible competitors up-river, and favoured by its geographical position (Fig. 2), the London and Thameshaven Oil Wharves, Ltd. rapidly expanded its tankage capacity until, in 1923, the company secretary was able to claim that his company had "the largest tankage capacity in the world for the public storage of oil."[6] Expansion continued during the inter-war years. The number of tanks increased from 15 in 1898 to 216 in 1946, and storage capacity from 8,000 tons to more than one million tons to-day. The company acts as a "warehousing" agent, it owns the tankage and wharfage facilities, but the petroleum which it handles remains the property of its clients. Since 1910, when the company was able to acquire a small refinery which had been erected in 1896 on an adjacent site, the London and Thameshaven Oil Wharves, Ltd. has been able to offer limited refinery facilities but refining has never been more than a subsidiary interest, and to-day the company concentrates entirely upon the function it has performed for the last seventy-six years—the public storage of petroleum.

War and Inter-War Years 1914–1945 : *Growth of Small Special-Purpose Refineries.*

The demand for petrol spirit slowly increased during the first two decades of this century. As the internal combustion engine was developed so the demand grew at an increasing rate. The great problem now was to increase the supply, and this was achieved by the invention of the process called "cracking." Normally petrol-spirit

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[6] *Petroleum Times*, March 31, 1923.

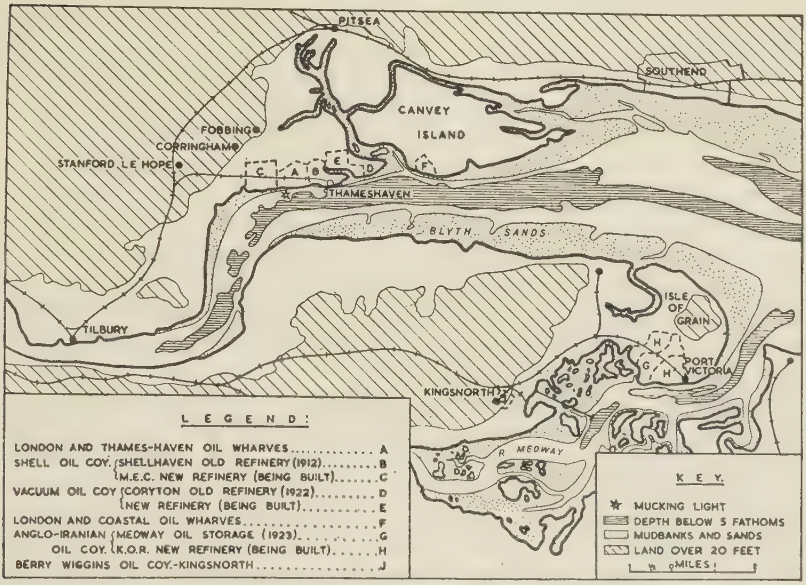
PITSEA
SOUTHEND
CANVEY
ISLAND
FOBBING
CORRINGHAM
STANFORD LE HOPE
C
A
B
E
D
F
THAMESHAVEN
BLYTH SANDS
TILBURY
ISLE OF GRAIN
H
G
H
PORT VICTORIA
KINGSNORTH
R MEDWAY
LEGEND:
LONDON AND THAMES-HAVEN OIL WHARVES .... A
SHELL OIL COY. SHELLHAVEN OLD REFINERY (1912) .... B
M.E.C. NEW REFINERY (BEING BUILT) C
VACUUM OIL COY CORYTON OLD REFINERY (1922) .... D
NEW REFINERY (BEING BUILT) .... E
LONDON AND COASTAL OIL WHARVES .... F
ANGLO-IRANIAN OIL COY. MEDWAY OIL STORAGE (1923) .... G
K.O.R. NEW REFINERY (BEING BUILT) .... H
BERRY WIGGINS OIL COY.-KINGSNORTH .... J
KEY.
MUCKING LIGHT
DEPTH BELOW 5 FATHOMS
MUDBANKS AND SANDS
LAND OVER 20 FEET
½ 0 MILES 1

Fig. 2.—Sites of oil refineries and wharves on the Lower Thames and Medway.

was produced by the process of distillation. But only a certain proportion of the crude petroleum could be refined into petrol-spirit by this means and the remainder had to be sold as fuel oil at a comparatively low price. By the process of "cracking," these surplus fuel oils are subjected to another process which breaks down the heavier hydrocarbon molecules into smaller ones, so producing a high quality spirit in addition to that already produced by the "straight-run" distillation method. The new process was begun on a commercial scale in 1913 in the United States.

After the outbreak of the 1914–18 war the demand for motor spirit increased rapidly, and the development of the cracking process enabled supply to match up to demand. New refineries opened up in the Thames-Medway area. In 1914 the Anglo-Saxon Petroleum Company, later incorporated into the Shell Group, constructed a refinery on the marshes at Shellhaven.[7] In 1921 a new refinery was constructed by the London and Thameshaven Oil Wharves, Ltd. to supplement their oil-storage business, and in the same year Cory Bros., who were well known as coal factors, turned to the manufacture and distribution of oil products. They bought the 1,500 acre site to the east of Shellhaven which had been occupied by Messrs. Kynochs, the big explosives manufacturers whose operations had ceased abruptly with the end of the war, and there they constructed oil storage tanks and a cross-cracking plant. They took over the little village on the marshes which had housed key munitions workers and they changed its name from

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[7] The fact that the Shell Refining and Marketing Company, Ltd., has a refinery at Shellhaven is purely a coincidence. The creek was called Shell Haven long before the construction of the refinery. The company took its name from the activities of its founder who traded in ornamental shells from the East.

Kynochtown to Coryton.[8] It is interesting to note that Cory Bros. had to build a new jetty on Thames-side to enable the tankers to approach the oil works ; the small wharf on Hole Haven had been adequate for the disposal of the explosives manufactured by Messrs. Kynochs, but there was insufficient depth of water there for oil-tankers.

On the south bank of the river a new company called the Medway Oil and Storage Company, Ltd. opened a refinery on the Isle of Grain in 1923. The Kent shore of the river Thames eastwards of Thameshaven is a continuous line of mudbank and sand called Blyth Sands. These treacherous shallows, exposed at low water, have prevented the commercial utilisation of the marshes. On the south-east side of the Isle of Grain, however, the scour of the River Medway brings deep water close to the shore, and this factor gave an early importance to the spot. In 1865 it was proposed to establish a cattle-landing wharf here, and to build a branch railway to Gravesend. A bill was passed through Parliament for this purpose, but the scheme never materialised. In 1876 the London Chatham and Dover Railway opened a service to the continent from Queenborough on the opposite side of the Medway. The South Eastern Railway Company, a bitter rival at this period, reacted by opening up a new service to the continent via the new branch line to the Isle of Grain which they completed in 1881. A jetty was built and the terminus was called "Port Victoria" after the Queen, who used the route on several occasions. The line was well patronised for some years, but in 1910 the continental service was diverted elsewhere and the jetty quickly fell into disrepair. It was about this time that the first oil tanks were installed in the vicinity by the Admiralty in connection with the naval dockyard at Sheerness. By 1912 there were 19 oil tanks on the site. It was important that there should be deep water close inshore to enable the big warships to make use of the oil installations, and it was this same factor, together with the railway facilities and the availability of land, which led to the establishment of the Medway Oil and Storage Company, Ltd. there in 1923.

The small refinery at Kingsnorth, further up the River Medway, is an interesting example of a location due almost to an accident and surviving in spite of geographical unsuitability. The site was used as an airship base in the Great War, and after the war the owner of the land decided to turn it into a small industrial estate. In the early 1930's the firm of Berry Wiggins and Company, Ltd. set up oil installations and a refinery there. At first they used the wharf at the head of the shallow inlet known as Damhead Creek, but this could not cope with the size of oil-tankers being used and so they built a jetty $1\frac{5}{8}$-miles long into the River Medway. Tankers tie up at this jetty, one of the longest in England, and the oil is pumped through large pipes to the refinery.

The last oil installation to be built in the area before the recent war was constructed on the Western tip of Canvey Island in 1938 by a company called the "London and Coastal Oil Wharves, Ltd." The

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[8] This little village is so isolated that the Institution Hall is licensed both for the solemnization of marriage and for the sale of intoxicating liquor !

Canvey Island U.D.C. refused to sanction the proposal on the grounds that it might injure the holiday resort character of the island. Prolonged litigation followed, and it is interesting to note that the sponsors of the scheme made great play of the fact that, since the investigation of 1928 had confirmed that Thameshaven, or Mucking Light as it had become in 1904, should be retained as the limit of navigation of oil tankers, this site on Canvey Island was the only remaining site suitable for oil-storage purposes on Thames-side. The Port of London Authority, owners of the land involved, won their case, but only after it had been taken to the House of Lords for a decision. Although a refinery was included in the original scheme the outbreak of war in 1939 put a stop to further construction and to-day the company still operates oil-storage only.

The decision of the Thames Conservators in 1872 to prohibit the navigation of petroleum-carrying vessels above Thameshaven was not readily accepted by the companies which had established oil installations and storage works further up-river, such as the Anglo-American Oil Company with an oil-depot at Purfleet. Protests were made almost every few years that the limit should be removed up-river to include Purfleet. It was argued that the bye-laws were passed at a time when little was known about the properties of petroleum, and when petroleum was carried in a very primitive manner in vessels not designed for that purpose. In 1908, when the Port of London Authority took over from the Thames Conservancy, particularly strong pressure was brought to bear on the new Authority to revise the bye-laws. A departmental committee was set up to examine the question. This committee heard evidence from the oil companies whose activities were handicapped by the regulations, from local authorities who were worried by the dangers of fire in built-up areas, and from the War Office who were anxious to safeguard their big magazines at Purfleet. Eventually the committee reported in 1913 to the effect that the limit of Mucking Light should be retained. Again, in 1927–8 another attempt was made to have the limit moved further up-river but without success. Finally, in 1938, with the threat of war looming on the horizon a project was put forward for the construction of underground tanks at Purfleet, this was strongly supported by the Ministry of Defence and so the limit of Mucking Light was quietly removed up-river to Crayfordness, a point opposite Purfleet. The change came too late to alter the essential geography of the oil industry of the River Thames. Revolutionary designs in tanker construction have made it possible for huge vessels of up to 30,000 tons deadweight to be built, so that deep-water frontage is now an absolute essential for all oil installations of any size.

Post-War Years, 1945–1951 : *Building of Large-Scale Refineries.*

During the inter-war years the practice was to build the big refineries near the source of production of the petroleum, in such places as Abadan, Curaçao and Aruba in the Netherlands West Indies, Houston in Texas. Such refineries as were built in England were usually designed for special purposes. The Shellhaven refinery was built largely for the manufacture of special oils and bitumen products, and the extension in 1936 was designed to produce special lubricating oils, including aviation lubricants. The Kingsnorth refinery specialises in bitumen and tar products. The Medway Oil and Storage Company, Ltd. operated for a few years making petroleum spirit from Russian kerosene oil, but the refining activities were closed down in 1932 when the company was absorbed into the Anglo-Iranian Group. The refineries were all on a small scale, and concentrated on a few special oil products. On the other hand, during this same period, the London and Thameshaven Oil Wharves, Ltd., which concentrated almost entirely on public oil storage, built up a huge business handling petroleum from all parts of the world. Cory Bros. also developed a large business in public oil storage.

After the 1939–45 war the emphasis changed completely. The consuming nations decided to locate the big new refineries, which were required to meet the enormously expanded demand for petroleum products, in their own territories, and to import crude oil instead of refined oil. A concerted plan was agreed among the O.E.E.C. countries, and under this plan the United Kingdom was to increase the throughput of petroleum in its refineries from four million to twenty million metric tons, a figure which has gradually been increased to 26 million metric tons. Great new refineries were started in various parts of the United Kingdom, and in September, 1951, the largest of these was opened at Fawley on Southampton Water. Already the import of crude petroleum has increased greatly at the expense of imports of refined oils. By 1955 Great Britain will be importing only a small proportion of refined oil. In the Thames-Medway area there are three new refineries in course of erection, and it is noticeable that all these are extensions to existing installations since there are no other sites available with adequate deep water frontage. On the north bank there are two new refineries, the new Shell refinery called the M.E.C. (Middle East Crude) Refinery, being erected immediately to the West of the London and Thameshaven Oil Wharves, Ltd. site, and the new Cory Bros. Vacuum Oil Company[9] refinery to the East of Shellhaven. The third new refinery is the "Kent Oil Refinery" being erected by the Anglo-Iranian Group on the Isle of Grain; this will incorporate the installations of the Medway Oil and Storage Company, Ltd.

The construction problems facing the refinery engineers are very considerable. The water requirements of a modern refinery are enormous, and possibly the greatest engineering difficulty, once a suitable location for the refinery has been found, is that of providing a regular supply of water in sufficient quantities. Before the war the modest requirements of the Thames-side installations were satisfied by pumping direct from the river and by the supply from wells on the site. For the new refineries bold new schemes have been devised to ensure regular supplies and a sufficient volume. At the new Shell Refinery site a supply of water has been obtained by sinking a shaft in the bed of the Thames at its deepest point opposite the site and connecting this to a sunken pump-house in the marshes by a large tunnel. The water is then pumped round the refinery, and finally is led back into the river. The problem at the Isle of Grain is rather different since the River Medway has a very much smaller flow of water. This has necessitated the construction of a reservoir on the foreshore opposite the site of the refinery to maintain a regular flow of water at low tide. The water is conducted from this reservoir to the refinery pump-house by a wide concrete channel, and the level is restored at high tide by natural flow from the river. Another construction problem, arising from the nature of the alluvial mud upon which the refineries are built, is that of securing a stable foundation for the numerous buildings to be erected, some of which are of a great height. For the heavier structures the usual method used is that of piling down to a solid foundation. On the Vacuum-Cory Bros. site some 10,000 piles, each 50–60 feet long, have already been sunk. Less expensive methods are used for the lighter structures such as the oil tanks and offices. In the past the oil tanks were frequently placed on a thin " carpet " of chalk or gravel rolled onto the marsh surface, but many of the tanks settled unevenly with a consequent loss of storage capacity. To-day special measures are taken to avoid this. In some cases piles have to be used, but on the Isle of Grain the engineers have developed an imaginative new technique for building up the marsh surface for the erection of oil tanks and lighter structures. Over a million tons of sand have been sucked from the sandbanks of the Thames Estuary, carried by barge to the Isle of Grain, and there deposited upon the marshes by means of huge pipes. By this means not only is the cultural landscape undergoing a transformation but also the very physical landscape as well.

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[9] In November, 1942, Powell Duffryn, Ltd., acquired all the shares of Cory Bros., which makes Corys a subsidiary of Powell Duffryn. In 1950, Vacuum Oil Company and Cory Brothers merged their interests on a 50/50 basis.

Engineering problems are not the only ones to be solved. There are sociological problems as well. The new refineries represent large potential, and actual, centres of employment. Many of the key workers must necessarily live near the works, and various companies are ensuring that houses are provided where possible for such workers. The other workers will also wish to live relatively near their work, and this fact has led to the rapid expansion during the last twenty years of the three marsh-edge villages of Stanford-le-Hope, Corringham, and Fobbing which overlook the industrialised Fobbing Levels. In the near future these three villages will coalesce to form one town of some considerable size. On the south bank the sleepy little village of Grain, once the most isolated village near London,[10] will house several hundreds of key workers, but even so, many workers will have to travel out from the Medway Towns or from Gravesend. The oil-industry has shattered the one-time peace and isolation of these riverside marshes. By 1954 the Thames-Medway area will be the largest single oil refining district in the United Kingdom, handling nearly one-third of the annual through-put of crude oil for the whole country, and also, with the possible exception of Rotterdam, the largest oil refining centre in Europe.

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[10] As recently as 1904 there was a man living in this little village of 600 people who had never been away from the island for a week in his whole life. He was 83. Burnett : *History of the Isle of Grain*, 1906.

The writer wishes to acknowledge the assistance received from all the major oil companies mentioned in the article, and from the Petroleum Information Bureau in London. Without their willing co-operation the latter section of this article could not have been written. He wishes also to thank Dr. H. Brookfield, of Birkbeck College, London, for valued criticisms.

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REFINERIES IN THE U.K.

ESTIMATED ANNUAL THROUGH-PUT OF CRUDE OIL
(In Thousands of Metric Tons)

Thames-Medway Area	1937		1954	
Shell Refining and Marketing Co., Ltd., Shellhaven	800		3,000	
Anglo-Iranian Oil Co., Isle of Grain	—		4,000	
Vacuum Oil Co., Coryton	250		850	
Berry Wiggins and Co. Ltd., Kingsnorth	90		65	
London & Thameshaven Oil Wharves, Ltd., Thameshaven	400		—	
Southampton Water		1,540		7,915
Esso Petroleum Co., Fawley		600		6,500
South Wales				
Anglo-Iranian Oil Co., Llandarcy		360		4,000
North West				
Shell Refining and Marketing Co., Ltd., Stanlow..	750		3,482	
Shell Refining and Marketing Co. Ltd., Heysham	—		1,851	
Lobitos Oil Co., Ellesmere Port	130		152	
Manchester Oil Refineries, Partington	—		122	
Berry Wiggins and Co., Ltd., Weaste	60		54	
Scotland		940		5,661
Anglo-Iranian Oil Co., Grangemouth	360		2,200	
Anglo-Iranian Oil Co., Pumpherston	150		173	
Shell Refining and Marketing Company, Ltd., Ardrossan	225		155	
William Briggs and Co., Dundee	35		34	
		770		2,562
TOTAL U.K.		4,210		26,638

Notes

1. The 1937 figures are derived from a table in the *Petroleum Times*, Nov. 5, 1948. The 1954 estimated figures are based on figures published in the *Second Report on the Co-Ordination of Oil Refinery Expansion in the O.E.E.C. Countries*, 1951. The figures have been revised to include up-to-date information obtained from the Petroleum Information Bureau.

2. The estimates for 1954 do not include the proposed Caltex-Trinidad Leaseholds refinery at Warsash on Southampton Water (capacity 1 million tons) since agreement on this site has not yet been reached.

THE INDUSTRIAL DEVELOPMENT OF LOWER THAMESIDE

JAMES BIRD*

DURING the present century there has been notable industrial development along the banks of the Thames downstream from the main dock area. This downstream migration is of much interest and field studies have therefore been made to record the present use of the floodplain eastwards from Woolwich as far as the reach near Shellhaven, where a significant widening and straightening of the river betokens the beginning of the Thames estuary. Before this twentieth century industrial development the chief characteristic of the Lower Thames marshes was isolation. Riparian settlements at Woolwich, Erith and Gravesend were founded entirely on chalk bluffs. This original isolation explains the siting on the marshes of sewage farms, explosive works, the Royal Arsenal at Woolwich, W.D. property and isolation hospitals. Arable farming is restricted to the inner margins because of the waterlogged subsoil. Thus, except where small areas have been parcelled out for allotments and works' playing-fields, the marshes back from the river are unimproved : for the industries are almost exclusively concerned with the facilities afforded by river-front sites.

THE INDUSTRIES

Fig. 1 is a location diagram and shows that the industries of Lower Thameside may be classified into five groups. The geographical background of these industries will first be examined under these group headings and then the general phenomenon of Thameside industrial development will be discussed.

(i) *Public Utilities*

Public utilities here comprise gas works and electricity generating stations and are very large undertakings indeed. Beckton Gas Works and Barking Generating Station are close together on the north side of the river, on opposite sides of Barking Creek. Both these establishments are the largest of their kind in Europe and each consumes 4,000–6,000 tons of fuel *per day*. With such enormous fuel requirements it is vitally necessary that coal should be imported in bulk by water. In fact the fleet of 4,000-ton colliers which is constantly engaged in this task is the modern carrier of the historic Tyne-London coal trade. There are other reasons for riverside location. Such installations require huge acreages for their site ; they should be to leeward of large areas of settlement and isolated for aesthetic reasons. Huge amounts of ash, often as much as one-seventh of the coal burnt, can be more easily stored and disposed of as clinker, or loaded into barges and dumped out at sea. In addition, generating stations need huge amounts of water, 600 tons for every ton of coal burnt, in order to condense the steam after it has done its work in turning the turbine, and the Thames is the supplier.[1]

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* Mr. Bird is a research student of the University of London, at present carrying out fieldwork in France.

(ii) *Cement Works*

Cement production is a complicated technical process and since it uses very bulky raw materials it must be located near them. Location on Thameside not only conforms to this rule but also provides additional advantages of tidewater communication and proximity to a great market. The manufacture of 100 tons of cement requires 160 tons of lime, 60 tons of clay shale and 38 tons of coal. Proximity to chalk and clay and to water communication for fuel imports are thus prime considerations. London Clay overlies the chalk near Purfleet and south of the river the Swanscombe outlier fortuitously brings clay close to the chalk workings. The cement works north of the river are all quarrying the ridge of chalk which averages about 100 ft in height. This ridge marks the Purfleet anticline and has been breached in many places by gigantic pits, dug down to river level. On the south bank of the river at Erith, Northfleet and Gravesend, cement works quarry the bluffs which the river has carved out of the chalk dip-slope. Excavations have taken place on a huge scale, for chalk had been quarried here for centuries before the cement industry accelerated the process after 1890. It seems most common for cement works to be located on the site of old quarries. This makes rail communication with Thameside jetties easier for then there is little gradient. Also, chalk and clay can be gravity fed to the works. Thameside cement works account for half the production of Great Britain.

(iii) *Paper Mills*

Like the cement works, all the paper mills depend on water communication. The raw material arrives as pulp bales, the original softwood having undergone one stage of modification at the exporting port to increase its value per unit of weight. The reason why softwood exporting countries do not work up the product further is that they could not supply a wide range of products since they do not accurately know the various strengths and tastes of the market. Also, if the quality of the exported product were increased and paper were exported, it would be more easily damaged than pulp in bulk sea transit. London is, of course, the nation's largest market for paper of all varieties, but particularly for newsprint and fibre boards used extensively in packing goods. Thus while the paper industry may be located physically adjacent to the cement industry, it manifests a complete contrast economically in being oriented primarily towards its market. Most mills produce a wide variety of paper goods, since, given an easy import

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[1] For an analysis of the factors concerned in the location of power stations see E. M. Rawstron, "The Distribution and Location of Steam-Driven Power Stations in Great Britain," *Geography*, vol. xxxvi, 1951, pp. 249–262. For further details on London's power stations see Chauncy D. Harris "Electricity Generation in London, England," *Geog. Rev.*, vol. xxxi, 1941, pp. 127–134.

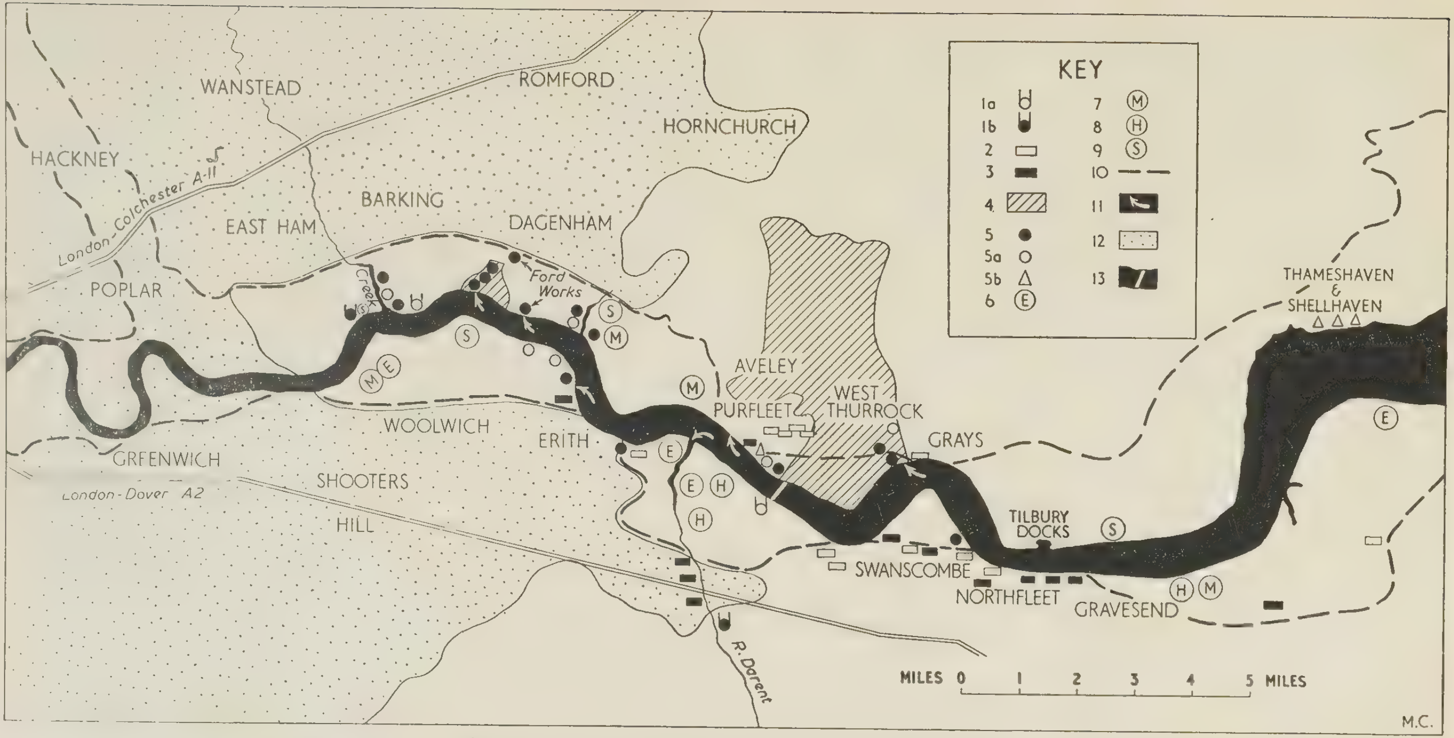

Fig. 1.—Location of Industries on the Lower Thames.

1. Public Utilities. (1*a*. Electricity Generating Stations. 1*b*. Gas Works). 2. Cement Works. 3. Paper Mills. 4. Industrial Estates. 5. Consumer Goods Industries. (5*a*. Timber Storage and Processing. 5*b*. Oil Storage and Processing). 6. Explosives Works. 7. Military Establishments. 8. Hospitals. 9. Sewage Works. 10. Inner boundary of Thames and Lea marshes. 11. Major coal-landing points. 12. Continuously built-up area of London. **13. Purfleet Tunnel.**

of coniferous or deciduous softwood pulp, a modern paper mill can produce any desired quality of paper by the various mechanical and chemical methods of papermaking.

(iv) *Industrial Estates*

A relatively new method of fostering industrial development is "the industrial estate." Such an estate here comprises a stretch of riverfront and adjacent land made ready for industry. This entails land reclamation, consolidation and drainage, wharf and road building and the provision of improved sites for lease by industrial concerns. In the marshland a great deal of capital has to be expended to be recouped slowly by rental charges. Even large industrial concerns cannot afford the huge double capital outlay required for first reclaiming and preparing the site and then building the factory upon it.

The land on which the Ford Motor Company's factory was built was originally reclaimed and made available by the industrial estate at Dagenham Dock. Most of the concerns on this estate work up imported materials and despatch the products for the home market, so that exported cargoes only total 50 per cent. of those landed. At the West Thurrock Estate development is on similar lines, but in a more youthful stage. The most notable arrival there so far is a modern giant soap works and, as will be seen later, the position of the estate is favourable for its fuller industrial development.

(v) *Consumers' Goods Industries*

The largest concern in this group is the Ford Motor Company with its associated wheel and car body factories. As is often emphasised the company is unique in southern England in possessing its own blast furnace and coke ovens. This underlines the excellent coal transport to Thameside, and the early realisation of this by the company is possibly due to the success achieved on an analagous site by the parent firm on the River Rouge, near Detroit.

Sugar refining, oilseed crushing, and timber storage and processing, are extensions of activities formerly carried on exclusively in the main dock area. With this group also may be briefly noted the oil storage and refining depots at Purfleet and Thameshaven-Shellhaven, typically occupying a position near to a great port, but isolated in site.[2] The depot at Purfleet has, however, been surrounded by later developments.

Now the common element of all these industries is that they make use of heavy raw materials or fuel and thus derive considerable benefit from the water highway of the Thames. On the opposite side of London the Great West Road plays a somewhat similar role but the factories it supplies house lighter industries. As is well known water transport is suitable for heavy bulk cargoes undergoing long journeys, i.e. for raw materials and fuel. Road transport has much greater flexibility and is suitable for carrying small, irregular loads relatively short distances, i.e. for the distribution of finished products. This contrast is due to the fact that water carriers have high terminal charges and low running costs and operate as large transport units; road carriers have negligible terminal charges but relatively high running costs and must of necessity operate as small transport units.

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[2] They are further discussed on pp. 79—88 of this issue.

This principle may be conveniently illustrated along the road leading to Barking Generating Station (Fig. 2). When this road was built in 1925 it became apparent that flanking it was a series of excellent industrial sites. From the diagram it is seen that establishments on the west side of the road will have the advantage of water communication, originally cheap land and good inland communications with the vast market and labour supply of London's eastern suburbs. Establishments on the east side of the road enjoy the same advantages with the exception of direct water communication. This exception, however, causes a great contrast in the types of industry to east and west. Typical of industries to the west are the production of concrete building materials, asphalt, and zinc oxide; to the east are found such industries as the manufacture of cork, synthetic rubber products, printing ink, and chemists' patent products. In addition there are seven undertakings on the west side of the road occupying the same length of road frontage as fourteen on the east. This is to be expected, for a waterside site implies a requirement for the delivery of bulky raw materials, which in turn necessitates a large site for storage and processing. The opposite sides of Creekmouth Road thus graphically stress the contrast between the large, sprawling riverside factory dominated by its raw material,

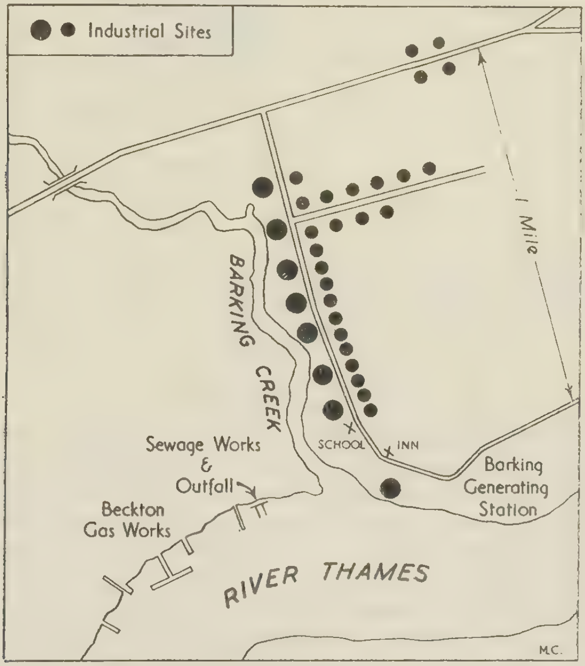

Fig. 2.—Industrial establishments along Creekmouth Road, Barking.

while the roadside factory is typically compact, often completely masking its activities by a neat if sometimes precious facade. Undoubtedly the industries of Lower Thameside are predominantly of the former type.

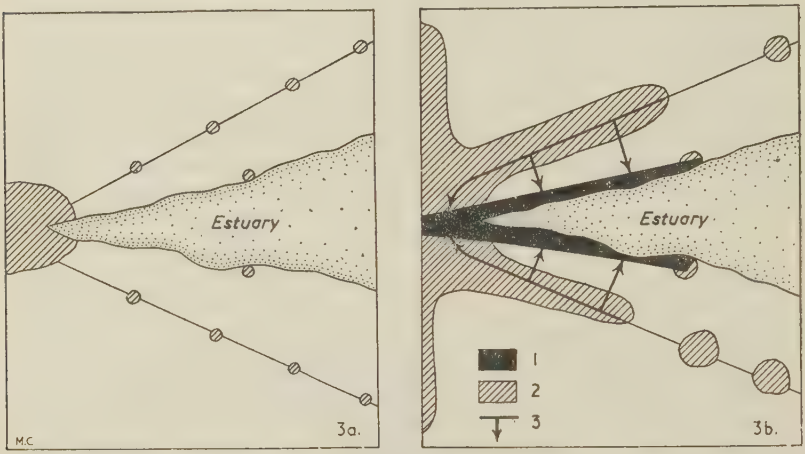

Fig. 3 (*a*).—A hypothetical port in the early 19th century.
3 (*b*).—The same port to-day. (1) Heavy industry. (2) Settlements. (3) Routes of daily migration by industrial workers.

The Pattern of Development

Bearing this in mind, together with the analysis of industries by groups, let us now examine the general pattern of Thameside industrial development by considering the example of a hypothetical port located at an estuary head, punctuating the deductive argument by reference to observed fact. Fig. 3a shows such a theoretical port as it might have appeared at the beginning of the nineteenth century. The heavy industries would have been in close proximity to the point where goods were landed, i.e. the port centre, because transport in the pre-1850 era was not well developed. For the same reason the workers would have been close at hand, mainly within walking distance. Moreover, the city centre was the best place from which to distribute the finished products. But as far as the import of raw materials is concerned any point along the estuary is as good as the city centre for unloading bulk goods which do not have to be re-sorted to many destinations. Yet certain requirements must be met before industry will come to the estuary shores. Transport inland must be efficient enough to overcome the comparative isolation of riverside sites. Engineering technique must be competent to deal with the unstable terrain and swampy conditions of an estuarine floodplain. These two requirements have in fact been met only during the present century.

We must next ask does any economic principle limit industrial extension down the estuary shores ? Fig. 4 is a simple graph showing how costs of prime importance for any industry vary relatively to each

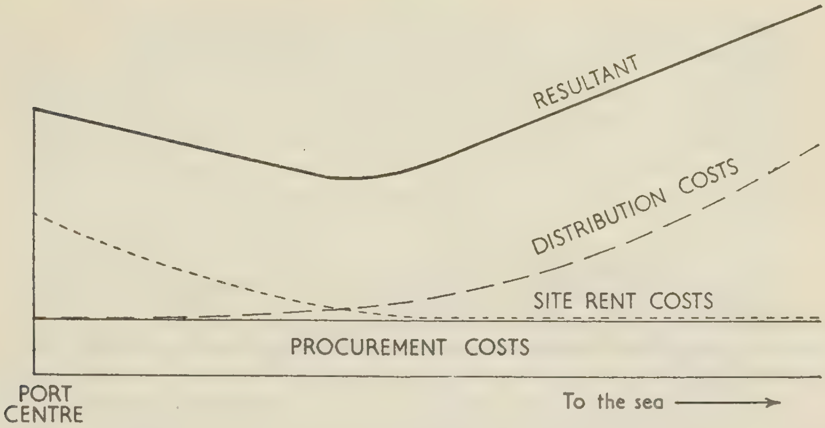

Fig. 4.—Factors in costs of manufacture for waterside sites.

other from the port centre seawards. As has been shown above, raw materials can be landed wherever there are docking facilities anywhere in the estuary without variation in cost. So procurement costs remain stable. Site rent costs and land values will naturally decrease away from the port centre until a minimum is reached. But distribution inland will become progressively more difficult as the distance from the port centre increases and distribution costs will rise. However, they will not rise so steeply at first as site rent costs decrease because after all the industry will be moving nearer some markets and the flexibility of road transport may even be assisted by being released from the congested port centre. The resultant of these three sets of costs shows a steady decrease downstream until a critical point is reached beyond which steep rises in costs are encountered. It must be emphasised that these costs only apply to sites with river frontage and thus development will take the form of an " industrial gallery forest," with dead-end rail and road routes linking the riparian industry to the main radial lines of communication. In the case of London and the Thames the critical point, beyond which there are great increases in costs, is at present found at Tilbury-Gravesend, 26 miles downstream from the city centre. But future developments, notably the opening of the Purfleet tunnel, will cause this point to shift further east.

At the moment it is uneconomic to engage in riverfront industrial activity east of Gravesend. This is due to the space relations of the most easterly of the Lower Thames marshes. Firstly, there is no chalk immediately accessible, and better sites for cement works are provided by the Medway water-gap crossing the North Downs a little to the east. Secondly, there is no easy way of transporting goods across the half-mile-wide river ; this restricts the hinterland of any prospective riverside factory. Thirdly, the area is 17 miles downstream from the London docks, which is about 7 miles beyond the economical range of lighter re-working. These three disadvantages outweigh for the present the apparently inviting flat land, no doubt cheap, which borders the river. The marshes east of Gravesend are thus just the same as when the prison hulks, mentioned by Dickens, were anchored in the river ; apart from the rifle range and a few cattle grazing desultorily on the rank grasses the mournful landscape remains as it was in the great novelist's days. But while physical and economic factors may now combine to favour industrial development as far east as Gravesend, this cannot in fact flourish unless industrial workers are within range.

Again transport improvements have acted as a causal factor. The effect has been graphically described as the "explosion of cities" (see Fig. 3b), when concomitantly with population increase, more and more people live further and further away from the city centre. They wish to live further out for two main reasons. Living conditions near the city centre are often poor, because of overcrowding ; secondly, rent and land values are generally much lower in the city's suburbs. But the majority of the people migrate along the main lines of communication, because they must travel back and forth each day to the industrial centre. In the case of London the two main lines of communication to the east are London-Colchester and London-Dover. Between them settlement has ever eschewed the marshes because of the liability to flood, unstable foundations for building and unhealthy conditions. But road transport now carries many thousands of workers daily between riverside factories and these main lines of London's eastward expansion. Vast new quasi-satellite towns at Harold Hill (near Romford, estimated population 23,000) and Aveley (17,000) will swell this labour supply for Thameside industry (compare Figs. 1 and 3b).

Such a migration of industry downstream appears as a recent systematic development of general cargo ports situated at estuary heads. Bayonne on the Adour exhibits a similar development on a much smaller scale ; Bordeaux has its industrial suburb of Bassens downstream ; Rotterdam has seen industry move seawards to Schiedam and Vlaardingen. However, while the general application of such a scheme seems eminently logical, only up-to-date industrial surveys of general cargo ports can show how far such ports conform to the pattern here deduced. Two considerations should warn us not to expect too close a correspondence. The first is the retarding and disrupting influences of the recent war. Secondly, it must be remembered that in any evolution of this kind Greater London is likely to show the first and more remarkable symptoms because it is the largest among general cargo ports and possesses the greatest population.

Thus modern means of transport enable the Thames marshes, for so long forlorn and shunned by the expanding "Great Wen," to play an increasingly important rôle in the nation's economy as the industrial development of Lower Thameside proceeds.

THE LATER DEVELOPMENTS IN HERBERTSON'S THOUGHT *

A Study in the Application of Darwin's Ideas

H. J. Fleure

IT is a happy fact that our Geographical Association has contributed to the commemoration of its beloved early leader, Herbertson; and the Association has gained thereby, through fostering a tradition that gives it dignity and influence. We commemorate a life-work cut short 37 years ago, when it was in process of a great expansion into new fields of thought.

A strong intellectual air blew through Edinburgh in the late 19th century. To name only a few thinkers with whom we are more particularly concerned, there were Tait the natural philosopher, Patrick Geddes the wandering genius, Bruce the geographical explorer, Bartholomew the map-maker, Murray the oceanographer, and Mill the physical geographer and climatologist; and among them, towards the end, a future star of our geographical constellation was just arising, Marion Newbigin. And Herbertson was amongst them, beginning his work with physical studies under Tait, but soon seeking to apply his mind to the appreciation of the distribution of natural phenomena such as rain and wind, temperature and air pressure. From Edinburgh Herbertson went on to universities at Freiburg in Breisgau, at Paris, where he made contact with the great French school led by Vidal de la Blache, and especially at Montpellier where Flahault was pioneering in studies of plant associations. Back in his native Scotland he worked awhile at the Ben Nevis observatory, and on the staff of the famous Atlas of Meteorology prepared by Bartholomew and Buchan. Then Mackinder fetched him away in 1899 to carry on the struggle for geographical studies at Oxford, and to take up the broadening of our Association.

With this background it was natural that Herbertson's first paper from his Oxford base should deal with The Monthly Rainfall over the Land Surface of the Globe. It was a study of distribution of a phenomenon which is a short term variable with a long term variability of the average. And it was such phenomena that Herbertson kept in mind rather than the immensely long term changes of uplifts, sea-levels and other geomorphological matters.

In 1905 Herbertson published his best-known paper entitled: The Major Natural Regions of the Globe. Here again, while not neglecting orography, he based his scheme of divisions mainly on climate, attempting to assess the facts of temperature, pressure and

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* The Herbertson Memorial Lecture delivered at the Spring Conference of the Geographical Association at Tenby on April 21st, 1952.

rainfall. When he came to revise his scheme, the contacts he had enjoyed at Montpellier led him to look more and more to a region's natural vegetation as a sort of synthetic result of the varied influences of many climatic factors even if temperature, pressure and rainfall still counted as the most significant. He became more biological.

At Oxford he cultivated and expanded his old Edinburgh contacts with Patrick Geddes, primarily a botanist, but how much else? Geddes as a botanist was a friend of Flahault and the Montpellier group, and, like them, he was deeply interested in man as a natural phenomenon. Now we may think this an obvious fact, a truism if you like. But, at the end of the 19th century, many even thoughtful people considered man as something set over against nature. We find that, to us, fantastic notion even among biologists. The bases of Darwin's thought had not yet been fully assimilated, but Geddes was one of the early workers concerned in the application, in some measure, of that thought in the human field. He sketched and expounded the concept of the Valley Section—shepherds and miners in the mountains, farmers in the valley, a port-city at the lowest bridgeable spot, typically somewhere near the estuary's head. This is a concept so highly generalised that many human phenomena cannot be brought into valuable relation with it. But it was, in some measure at least, an attempt to think of man and environment together. This thought worked increasingly in Herbertson's mind.

A short time before his death Herbertson came to Aberystwyth, already far from well; and I had the privilege of spending a good deal of time talking things over alone in his company, a relation in which his wisdom, courtesy and sympathy made him specially distinguished. Now, I had begun my studies in isolation in the years 1892–5 by trying to understand the thought of Darwin, and had felt I must make it my main work to get to a university and research into the idea of evolution applied to humanity. It was, therefore, most interesting to exchange thoughts with Herbertson, who also had been led to the Darwinian point of view, though by a different road. Unfortunately we have only the beginning of the development of his thought in this field. It is embodied in the incomplete paper which was published after his death: "Regional Environment, Heredity and Consciousness." The sober geographer, he says, is concerned to analyse resemblances and differences between various lands and their peoples to see how far the conditions (of human society) in one correspond with those in another—only, of course, in part. Quickly he goes on to discuss briefly the past in the present, and he says that the heritage of a society implies much more than physiological inheritance through continuity of germ-plasm, much more even than the inheritance of tradition by children from forebears. There is, for example, the inheritance from dead men and women whose works live after them, and there is a partial synthesis of social tradition passed on from generation to generation in a society, but passed on with an almost infinite diversity of degree of that handing on in the cases of different individuals and groups in that society. The attempt to separate and set in contrast man and environment Herbertson characterised as scientific murder. There are no men apart from their environment, an environment that, in addition to material and physical features, includes biological, social and psychical influences. And nowhere is there changeless permanence, nor is there unrestricted change. The spread of ideas is not altogether under the influence of cables and wireless ; there must be a society able in some measure to receive the incoming thought. Only within very narrow limits can we hurry change of thought—and here I pass from truisms to one of the most momentous and neglected facts of our age. To transplant into some far land of very different climate some scheme of land tenure or government or labour organisation that has had a fair success among, let us say, ourselves is one of the gravest mistakes our time can make. We notice continually that regions are brought into contact with one another, and our world is full of the consequent problems. But let us not go on making the old mistake of imagining that we are conquering nature, that we are masters of environment. European intrusion in Africa, often with the best intentions, and even at times with a good deal of application of science, is perhaps doing even more harm to the soils of Africa than the native traditional methods. And what about Oklahoma, or, on the other side of the world, the impoverishment of the soil in large parts of North China ? As processes of land use develop, be it for farming or mining or industry, we just make our relation with our environment more and more complex. And our best laid schemes usually fall short because some unforeseen result has altered the balance. The plough in Oklahoma in the late 19th century meant that the sons, sometimes the grandsons, of those who succeeded in the notorious rush of 1889 became the poor Dust Bowl Okies of the nineteen-thirties, with Californian State Police trying to prevent them from entering as refugees into that happier land.

But I do not want to deal with matters of public policy in an address in memory of Herbertson. It seems to me to be more appropriate to try to carry his special lines of thought a little further if possible, into questions of research that one hopes may develop.

If man and environment are to be studied together a great advance of science may be hoped for as more facts of climate become known, facts beyond the data of temperature, pressure and rainfall. One large group of facts needing study concerns the varying quality of radiation. The belt of latitude receiving the vertical rays of the sun at noon changes by 1° in rather under three days near the equinox, but the change is slower and slower towards the solstice. As a result of this a belt of some 10° on the equatorial flank of the Tropic has the nearly vertical rays for as much as two months, and they are very steep for an even longer time. Moreover, in the case of the African belt from latitude 13° North towards the Tropic of Cancer, during the season when the inclination of the sun's rays is greatest (when the sun's rays are vertical over the Tropic of Capricorn), the season is very dry and the diffused radiation from the blue sky is very powerful.

The radiation in what may be called the drier intertropical latitudes is thus, on both counts and around both solstices, very powerful and theoretically very rich in blue, violet and ultraviolet rays. Whether it is so in practice at particular places is what one would like to know. Wind may lift loose soil and the particles in the air may stop and transform these rays, or at least a proportion of them. Then there may be globules of moisture from an exposed water surface, and these globules also absorb and transform this radiation.

Looking at this matter of quality of radiation from the point of view of the human side of the man-environment partnership, we find that brown skin pigment stops a large proportion of these rays which would otherwise penetrate into the skin and, it is claimed, might cause blisters with much risk of septic infection. The stopping of the rays converts them into longer wave radiation that can heat the skin surface a little, but only very little. It is especially in some African regions in latitudes 10–15° North that men with specially dark skins are found ; in latitudes 15–23° populations are very small, and often there is none at all. Moreover the Tuareg of the Sahara are well-known as the Men of the Veil ; they protect their skins from wind-blown dust, and probably the same protection guards against the power of the short-wave rays ; these men are, of course, not intensely dark. It must be understood that the powerful rays are not lethal even in excess ; there is merely an advantage in protection from extremes of their power. I have known cases of British men who have had to retire from government service in places where the short-wave rays undermined their energy and health. Again, to take another example, south of the Equator a warm current flowing southward along the east coast gives moisture that, to some extent, reduces the incidence of the rays, though Europeans are very liable to a touch of sun, as the trouble is called. But, on the west side, the cool Benguela current flows equatorwards, and a good deal of Angola is very dry. An area near the coastal edge of the African plateau in Angola has very intensely pigmented inhabitants.

It may be that, in forest areas, transpiration from trees gives moisture enough to reduce the power of these rays to a significant extent, and there are cloudy and rainy belts which, in spite of being at certain seasons under vertical radiation, yet get comparatively little of this short-wave radiation during a considerable part of the year. Here comes in another climatic factor about which, perhaps, more is known but hardly enough. This is the matter of relative humidity. If that relative humidity is high, evaporation is reduced. Also, with temperatures above that of the blood, there cannot be much radiation of excess heat from the body. In relation with this, we note that several peoples of West Africa have skins which are adapted to promote cooling both by maximum radiation and by maximum evaporation. The dry layers of the outer skin are reduced to almost nothing, the capillary blood vessels of the skin are very numerous and bring much warm blood to it, for cooling when that is practicable. The red of the blood mingles its effect with that of the brown pigment which protects against seasonal excess of the short-wave rays—and so we get a brown skin with a touch of red in the brown, a combined effect, one might say. Large sebaceous glands and sweat glands are accessory helps.

Solar Radiation in Arctic latitudes is, of course, seasonal, but, in summer, some of it goes on nearly all through the 24 hours. Its effects on vegetation are well known ; its effects on our skins need more study, based on the quantitative estimation of the short-wave rays. They reach the skin not only directly but also by reflection from the snow. Obviously there is need rather to limit than to promote evaporation and radiation from the skin, and Arctic peoples have the skin rather dense and yellowish, with blood-vessels deep sunk, but they have a brownish skin, tinged with yellow probably because of the skin density, and sometimes with a reddish tint, which also characterises some of the American peoples who reached the New World via the Behring area. Some European explorers in the Arctic get skin troubles.

The hair of the Arctic, and the Mongolian, peoples grows in tubes, called follicles, which have firm muscular lips and regular round form so the hair grows stiff and straight and rather coarse, and there is little evaporation from these follicles. This contrasts with the loose oval follicles of the African's hair, which, in those follicles, grows with much irregularity and many kinks.

Climatic data other than short-wave solar radiation and relative humidity could be studied in relation to man. For example, in parts of the equatorial zone, convection currents of air are set up as the morning progresses and by the afternoon there may be a thunderstorm and heavy rain, clearing off before sundown. We know the lassitude that affects us in middle latitudes as a thunderstorm approaches, and the effect of daily storms for considerable seasons not only on the daily rhythm of activity but also on the constitutional vigour of inhabitants of some equatorial areas, might be investigated.

In the equatorial zone Europeans try to live on high land, and the effects of the strong sunlight and probably other climatic influences might be studied further. It is widely thought that, in warm lands, or at least under some conditions of hot climates, the kidneys are at a lower level of activity and that this has given importance to the great development of sweat glands in many Africans. They serve as organs of excretion of waste through the skin, and some of the solid portion of that waste is deposited in the skin as granules of brown pigment. Some of the skin colouring of Africans may thus be deposition of waste, and so only partly related to the stoppage of excess of short-wave radiation mentioned above.

There is also a good deal of conjecture concerning climate and sex and fertility in equatorial regions, and, in connection with all these problems of climate and man, we should remember that the optimum temperature for humanity is about 60–75° F. with cooler spells and cooler nights. In other words, man is not really fully at home in the equatorial regions or the arctic regions, though he has worked himself into highly specialised relations with both. Attempts to build a dual society in equatorial areas with a sharp separation of function between European and African are a new experiment in human affairs. Hitherto immigrants of superior technique coming into a country have intermarried with native girls and melted into the population, with some not very successful resistance as in the case of the high castes in India. We do not yet know whether Europeans can continue to reproduce their stock in several areas of hot climate or dry hot high land.

More indirect relations between climate and man are those that affect the soil on which man depends. At what temperatures does the rate of destruction of humus tend to exceed that of its formation ? For many environments long periods over 75° F. mean that the humus decomposes as fast as, or faster than, it is formed. And, if the climatic régime is one, as many are, of bright mornings, rainy afternoons and clear nights, the rain may wash out CO_2 from the soil, and its place will be taken by oxygen, which will promote decay of humus, the product of decay being washed away by the next rain. A forest-covered area transpires a lot of water which in a recently deforested area would wash out the humus ; also the temperature of the uncovered soil would be high and decomposition of humus would be more rapid.

On the whole, equatorial forest left to itself would often just replace the humus leached out ; there is often a poor soil under the thin humus. The forest does not easily grow after cutting. Both the Maya cities and Angkor are now in secondary jungle, not regrown forest. Naturally, hoe cultivation and, still more, the plough open up the soil for rapid decomposition of humus and leaching. Bacteria transform nitrogen into nitrates and, with temperatures of 75° or so, this process is very rapid, and increases enormously at higher temperatures, so the nitrates and other soluble salts formed may be washed out before plants can use them. And this leaching is far more rapid where humus is absent or occurs in only small quantities ; colloidal matter is very important in this connection.

Many plants blossom and fruit when they get sunshine at a temperature of about 68° F. So the length of the period with mean day temperatures above 68° F., but below 75° F., is of considerable importance when we try to understand climate as a factor in human affairs. And in this connection let us note that several fruits are at their best near their northern limits, though, in most cases, as in that of the vine in France, the plants near their northern limits are grown only in specially favourable spots and with special care.

Plants grow only very slowly during a period when the temperature is about 42° F., and plant growth nearly ceases when this lower limit is transgressed, so the length of the period when day temperatures are below 42° F. is again important in connection with studies of natural regions, and can make this study more and more a topic for scientific research of practical importance, in addition to its value in education.

These few examples are intended to show how the study of natural regions based on climate and vegetation may be developed and may help research into what is probably one of the two most urgent problems of humanity—that of soil conservation. The other is the Malthusian problem of population increase, into which I cannot enter on this occasion.

I have dealt in this latter section only with temperature and humidity as affecting soil changes, but no doubt wind and perhaps even marked excess or great deficiency of the short-wave radiation plays its part as well.

Herbertson's posthumous paper was called " Regional Environment, Heredity and Consciousness," and he was trying to liberate our subject from an artificial limitation then approved even by some geographers. These limiters thought we had enough to do in picturing the actual world as it exists in the present. The more important work is to see how the present world has come to be what it is. Only in this way shall we get beyond gazetteer description into the region of understanding of the present world. That in this field of study we meet historians and anthropologists starting from standpoints and using disciplines differing from ours, is a gain to all. None of us is able or lives long enough with intellectual initiative to look all round, so we supplement one another and, if there is some overlap, that is all to the good. Let us build out on Herbertson's substructures and have no fear of losing our subject's identity. The historians and anthropologists need geographers' help as also we need theirs.

THE LE PLAY SOCIETY

President : Sir E. JOHN RUSSELL, D.Sc.

SUMMER PROGRAMME 1952

FOR STUDIES IN GEOGRAPHY, AGRICULTURE, SOCIOLOGY, ETC.

Ballycastle.—Co. Antrim. Aug. 19th to Sept. 2nd.
Leaders—Sir E. John Russell, Miss Margaret Tatton, Captain G. Campbell, B.A., with help from the Dept. of Geog., University of Belfast.

Flensburg.—Schleswig-Holstein. Germany. August 12th to 28th.
Leaders—Mr. J. M. Mogey, M.A., D.Sc., Lecturer in Sociology, University of Oxford, and Miss M. M. Millburn, M.A.

Les Eyzies-en-Perigord.—Dordogne, France. Aug. 26th to Sept. 6th.
Archaeological and Folk-lore studies with Mr. A. D. Lacaille, of the Wellcome Historical Museum, London, and Mrs. Lacaille.

The Le Play Society's University Student Group. (August).
A meeting is being arranged in **Belgium** under the leadership of Mr. R. C. Honeybone, M.A., Institute of Education, and Miss A. M. Coleman, M.A., Kings College, University of London. (Please write for details).

All enquiries should be addressed to Miss Margaret Tatton, F.R.G.S., Director, at The Birlings, Birling Gap, Nr. Eastbourne.

OBITUARY

Ernest Young—1869–1952

Ernest Young died on February 10th at the age of 82 after a short final illness. Trained as an elementary teacher he soon found himself an inspector of Anglo-vernacular schools in Siam. After his return to England he became headmaster of the John Lyon school, Harrow. It was at this stage that I met him. He was giving a geographical lecture in which I disagreed violently with what he said and in the ensuing discussion said so. His acceptance of the criticism was characteristic of him. He came up to me afterwards, shook hands and said he was glad to meet me—and that was that. In all the forty odd years I knew him I never saw him angry or even mildly cross. He was a great supporter of the Scout movement and indeed he ran the County School, to which he moved from John Lyon, on Scout lines. He spoke of himself, too, in relation to his staff as " chairman of the board of education of the school." Later he was assistant secretary for higher education under the Middlesex County Council. He joined the Middle Temple and took his final in 1916 but never practised. About this time, he contested North Hammersmith unsuccessfully in the Liberal interest. All his life except when he was headmaster he was continually on the move and whatever he did or wherever he went he wrote a book. " The Kingdom of the Yellow Robe," " Finland, the Land of a Thousand Lakes," " How to run a Troup," " The new Era in Education," remind one of a few things he did in his earlier life. Everywhere he went he made friends. Like another traveller he was a friend of all the world. But his friendships, like everything he did, he kept in watertight compartments. He had a great zest for life, but after his wife's death there was always a shadow of which he rarely spoke. He had no children and their absence cast another shadow, for he loved children and they loved him.

He suffered from diabetes for years, but he carried on, and at last it killed him. After his first attack, he travelled all over South America and later over a good part of North America and Europe, not to mention Britain.

His services to geography were many, varied and often unobtrusive. At one time, before there was an executive, he served on the Council of the Geographical Association. He did good service by organising new branches and resuscitating old ones. He was also in great demand as a lecturer. He could always hold an audience or a class. His geography books are of three kinds. In addition to those named above there are some early ones of which " A peep at Corsica " is typical. Then there are the school textbooks which he wrote with me or with others ; of those he wrote with me all I need say is that I could have written none of them without him. Of all his books the ones that I myself like best are those on the Americas, " South American

Excursion," "North American Excursion," "West of the Rockies." I do not know any books quite like them. They are interesting records of travel by one who notices things and people, but many of the things he notices are not usually noticed. He notices not only phenomena but the *relations* of phenomena. They are full of just the kind of things that the good geography teacher wishes to know. There are many travellers and there are many good geography teachers, but very few are both. Young was one of the very, very few. *Ave atque vale.*

J. Fairgrieve.

J. L. Holland and J. W. Page

In the beginning of the year the Association lost two very staunch old friends, J. L. Holland and J. W. Page. While still a master at St. Saviours and St. Olaves Grammar School, Holland was in 1903 elected to the rather exclusive committee of the Association and retained his seat when appointed two years later to the secretaryship of the Northamptonshire Education Committee, a post which later as Director of Education he held for the rest of his working life. Here in his quiet unobtrusive way he was of great service to geography specially in his own county but also wherever his advice was asked. After his first election to the committee of the Association he continued to serve on that body and when under the new constitution the committee became a council in 1913 he was again elected and served many terms, his last being from 1939 to 1941. Under his influence the Northamptonshire Branch was started in 1919 with Holland as president; since then it has been notable in what it has done as a branch over many years, beginning with a survey of local industries and including an investigation on the "use of the cinema in teaching geography" in 1920. An outstanding piece of work was the issue of the Land Utilisation Map of Northamptonshire in 1929 based on a survey by elementary school children on 6-inch maps provided by the Education Authority; this was the prototype of the National Land Use Map. Again, notable as a precedent, was his persuasion of his committee to grant bursaries to those attending summer schools of geography.

J. W. Page had the same quiet manner as Holland. As a London teacher he helped to start the North London Branch of the Association in 1907 and remained its keen and efficient secretary for a number of years. On his transference to Devonshire as a Government Inspector he was instrumental in starting a branch at Plymouth and watched over it till he retired and moved to Shropshire. He obtained a Gilchrist Medal after an intensive course of lectures by Dr. Haddon. Thereafter he retained his interest in primitive cultures, giving lectures to the Association on the subject and contributing articles to the *Geographical Teacher.*

J. F.

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PRIMARY

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LIFE IN MANY LANDS	**4/–**
JOURNEYS ROUND THE WORLD	**4/6**
OUR HOMELANDS AND OUR NEIGHBOURS	**4/10**

SECONDARY

By **V. C. Spary, B.Sc., F.R.G.S.**, and **W. A. Perkins, B.A., F.R.G.S.**

THE SOUTHERN LANDS	**5/9**
NORTH AMERICA AND ASIA	**6/–**

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GEOGRAPHICAL ASSOCIATION

"GEOGRAPHY"—EDITORIAL POLICY

Readers of *Geography* are, of course, well aware that the increased costs of paper and printing present serious difficulties to every society and association that publishes a journal for distribution to its members. Paper, in general, now costs approximately seven times what it did before the war, and the Consultative Committee for Co-operation with Printing Organizations set up by the Royal Society sees no likelihood of either printing or paper costs being reduced in the near future. The Executive Committee has already examined the desirability of restricting our quarterly journal to three numbers a year and on several grounds has decided against it. It is therefore more than ever necessary to ensure that we use the printing and paper resources at our disposal to the full. *Geography* must be the best value that money can buy. A sub-committee of the Executive Committee will therefore shortly meet with the Honorary Editor and the panel of editorial assessors to examine thoroughly editorial policy and arrangements, and will in due course report to Council. It would be of much assistance to this committee if members and branches would give serious thought to the question of the content of our magazine and send their expressions of opinion to the Honorary Secretary.

SUMMER SCHOOL, RHOOSE. AUGUST 2ND TO 16TH, 1952

Late registrations for the Summer School are now being placed on a waiting list to take up possible cancellations, all available places having been reserved.

SPRING CONFERENCE, 1953

Arrangements are being made for the Spring Conference in 1953 to be held at Lincoln. Details and dates will be announced in due course.

BACK COPIES OF "GEOGRAPHY"

Owing to the gratifying but unexpectedly high increase in new members since December, 1951, stocks of the November issue of *Geography* have been exhausted. As a number of requests for this part of the journal have been received, the Association would be very grateful if spare or unwanted copies could now be returned to headquarters to enable us to meet these demands.

SUMMER CLOSING OF HEADQUARTERS

Headquarters Office and Library will be closed from Saturday, August 2nd, opening again on Monday, August 11th, 1952.

NEW RECORD OF MEMBERS AT HEADQUARTERS

A new record of members, other than those already belonging to existing branches of the Association, has now been completed. From this record, which is based on a "locality" arrangement by counties and cities, the names and addresses of full members of the Geographical Association in any given neighbourhood can be supplied in response to enquiries about the forming of new branches or the revival of those temporarily closed. This information, particulars for the use of branch officers, and the names of existing branches and their honorary secretaries will gladly be supplied on request from headquarters.

UNESCO BOOK COUPONS

The attention of members is drawn to the UNESCO Book Coupon scheme, the intention of which is to facilitate for institutions and individuals purchases of publications from other countries. Since the total value of the coupons allocated to each country is limited (for various reasons), allocations of coupons by the national Distributing Body may be made on a priority basis, whereby the needs of educational, scientific and cultural institutions receive first priority.

In response to members' enquiries, the Geographical Association has received confirmation that UNESCO Book Coupons may be used for the purchase of wall-maps from Germany (Bundesrepublik). The coupons may be used either for direct purchase from abroad, or for purchase through a local bookseller or through Book Tokens, Ltd., 28, Little Russell Street, London, W.C.1, which is the distributing body for the United Kingdom to whom all enquiries should be addressed.

INSTITUTE OF BRITISH GEOGRAPHERS : PUBLICATIONS

The Association's Library is indebted to the Institute of British Geographers for copies of its two latest publications, Numbers 15 and 16, the *Transactions and Papers* for 1949 and 1950, respectviely. The *Transactions*, 1949, report the general meeting of the Institute in January of that year at Oxford, and the summer field meeting in September at Sheffield. The general meeting in 1950 was held at Cambridge. Nine of the twelve papers read at the Oxford meeting are published in Publication No. 15 ; several are detailed regional studies.

Under the title " Watershed breaching by ice in Scotland," D. L. Linton discusses glacial diffluence and transfluence with special reference to the Scottish Highlands. R. F. Peel, in " A study of two Northumbrian spillways," discusses the geomorphology of glacial lake overflow channels at Beldon Cleugh and East Dipton. Urban and settlement studies include " Derby : a railway town and regional centre," by E. C. Vollans, " Green villages of County Durham," by H. Thorpe, and M. J. Wise on " The evolution of the jewellery and gun quarters in Birmingham." The regional development of the city and its relationship to the agricultural development of the *Huerta*, the surrounding irrigated plain, is traced by J. M. Houston in " The urban geography of Valencia." S. J. Jones describes his paper " The gold country of the Sierra Nevada in California " as " a centennial essay rather than a detailed regional description." In it he outlines the geographical background of the gold rush of 1849 and the development of the present day geography of the region consequent to that event. " Further notes on the presentation of comparative regional climatology " is an article by E. M. Frisby and F. H. W. Green reporting developments in an investigation of an approach to comparative climatology through the qualitative and quantitative study of air mass types, the region referred to being the British Isles. .

" The trade wind circulation of the world," by P. R. Crowe is followed by a second paper in Publication No. 16, " The seasonal variation in the strength of the Trades " ; the first attempts a world-wide survey developing a statistical technique of mapping the wind systems, illustrated by 12 monthly charts of the constancy of the Trades ; the second paper pursues the enquiry into the seasonal " pulsation " as well as migration of the Trades.

The remaining seven papers in Publication No. 16 include Professor Wooldridge's presidential address, " Reflections on regional geography in teaching and research," and two posthumously published papers, " Certain underpinnings of our arguments in human geography," by the late K. G. T. Clark, and " The influence of physical features on rural settlement in east-central Sweden," by the late R. T. Cornish. Two regional geomorphological studies are " Dawlish Warren," by C. Kidson, in which the author discusses the evolution of the sandspits across the mouth of the river Exe, and " Erosion surfaces in north Cardiganshire," by E. H. Brown. I. S. Maxwell's paper, " The geographical identification of Domesday vills " is concerned with the correct locating of vills, especially in Yorkshire, by a study of the circuits of the Domesday Commissioners and the basic geographical arrangement of the enquiry. In " Some new boundary problems in the Julian March," A. E. Moodie illustrates some of the problems created in the region at the head of the Adriatic Sea by the political decisions of the Treaty of Paris in 1947.

Publications No. 15 and 16 cost 21s. each and are obtainable from George Philip & Sons, Ltd., 32, Fleet Street, London, E.C.4.

GEOGRAPHICAL FIELD WORK AT JUNIPER HALL, DORKING.

There has been an encouraging response to the increased number of courses in geographical field work to be held this year at Juniper Hall Field Centre. Courses of one week (Wednesday to Wednesday) are arranged to meet the need of students at different levels—university, training college and school sixth form. The courses comprise expeditions and assignments of practical work on the physical and human geography of the western Weald and the surrounding downlands.

Sixth form courses during the Easter vacation and at the end of the summer term are already filled. There are still vacancies in school courses at the following times :

June 4th to 11th.
July 30th to August 6th.
September 10th to 17th.
September 17th to 24th.

Pupils may attend these courses either with or without their own teachers. Courses may be given at other times according to the demand. Special courses, or field work for small groups of students can usually be arranged, especially at midsummer and in the autumn term. Enquiries about the Field Centre should be addressed to the Warden, Juniper Hall, Dorking, Surrey.

UNIVERSITY OF LONDON: SUMMER SCHOOL

A University Extension Summer School is to be held at Wye College, Kent, from August 16th to 30th, 1952. Of interest to geographers are courses 9 and 10, "Physical Geography and Geomorphology" and "Regional and Historical Geography." Lecturers in charge of these courses will be respectively Mr. J. T. Coppock, and Dr. M. J. Wise. The prospectus and application forms may be obtained from Mr. C. P. Thomas, B.A., Senior Assistant, University Extension Courses, University of London, Senate House, London, W.C.1.

INTERNATIONAL CONGRESS OF ANTHROPOLOGICAL AND ETHNOLOGICAL SCIENCES

The fourth session of the Congress will be held at Vienna, from September 1st to 8th, 1952. Preliminary information about the session may be obtained from the Assistant Secretary; applications for membership of the Congress should be sent without delay to the Secretary, Wilhelm Koppers, Institut für Volkerkunde, Neue Hofburg, Corps de Logis, Vienna, 1, Austria.

FRENCH GEOGRAPHICAL FILMS

L'Institut Francais du Royaume-Uni has recently issued a catalogue listing films that can be hired for a nominal sum (1s. to 5s.), depicting various documentary, scientific, and other subjects. Some of the films show aspects of French life and of the countryside, or of African and other French colonial regions that might be of value to teachers of geography. For further details and catalogues, etc., application should be made to L'Institut Français du Royaume-Uni, 15, Queensberry Place, London, S.W.7.

REVIEWS OF WALL CHARTS AND FILM STRIPS

BY THE VISUAL AIDS COMMITTEE

Wall Charts. Educational Productions, Ltd., 17, Denbigh Street, London, S.W.1.

Britain : 9 sheets, 24 × 19 in., 45/–; **The United States of America :** 8 sheets, 24 × 19 in., 8/–. **British Commonwealth Series : Part I, Australia :** 12 sheets, 18 × 12 in., 10/–; **Part 3, South Africa :** 12 sheets, 18 × 12 in., 10/–; **Part 10, Eastern and Southern Africa :** 6 sheets, 24 × 19 in., 6/–; **Part 13, Pakistan :** 8 sheets, 18 × 12 in., 7/–.

Although a variety of styles is used, all six series of charts have the same general layout. The topics usually considered are physical geography, history, peoples, government, general geographical aspects (natural resources, farming, industry, communications, etc.), and the country region by region. With some exceptions, each chart has a map of some kind, surrounded by half a dozen pictures and by panels of notes.

Speaking generally, while bold—and in some cases pleasing—colours may be expected to attract the attention of children, it is by no means clear what is the further aim of these charts. By their nature they are not suitable for class teaching—maps and pictures are too small, and the notes are not legible at more than a few feet. It must be assumed, therefore, that they are intended for work by individuals or small groups. But the maps, with few exceptions, are quite unsuitable for this kind of work; they collectively commit almost every kind of error from which geography teachers strive to protect their pupils. There are maps without scales; maps with unexplained, misleading or wrongly placed symbols; and maps with serious inaccuracies or even impossibilities. Most of the pictures, especially on the smaller sheets, are unsatisfactory. Many are much too small, and even some of the larger ones contain unrecognisable detail. Many have unnatural and misleading colour schemes, or are merely impressionistic. Frequently, there is no indication of the exact locality of a picture; in some cases no captions at all. The notes are, for the most part, snippets of information, as useless, except for the sake of learning something by heart, as the "capes and bays" or "products" of an earlier generation. Nor are they invariably reliable.

By and large, these charts attempt to cover too much ground, and display a misconception of the purposes for which such aids are really suitable. If each chart concentrated on one limited subject, and illustrated it by really first-rate reproductions or photographs and where necessary by boldly drawn maps showing facts in their geographical relationships, they would accomplish an educational object which the series fails to achieve.

Norway: 3 sheets, 24 × 19 in., 3/–. **Iceland:** 2 sheets, 24 × 19 in., 2/–.

Dealing with less complex regions, these two small sets of charts are more successful than those reviewed above. Nevertheless, the main map of Norway leaves much to be desired, and several places in both countries which figure in the pictures—even major features like the Hardanger Fjord—cannot be found on the maps. The pictures, in pleasing but unnatural colours, may tend to mystify rather than enlighten, and the notes suffer from the defects inseparable from this method of presentation. These charts do not teach the geography of Norway or Iceland, but they do enable a certain amount of general information about these lands to be learnt.

Luxembourg: 1 sheet, 24 × 19 in., 1/–.

By means of two maps (one of Luxembourg on a scale of approximately three miles to an inch, the other an index map showing its position in Western Europe), four pictures, and some brief notes, this chart brings out the essentials of Luxembourg about as well as could be done on a sheet of this size.

Malta, G.C.: 1 sheet, 24 × 19 in., 1/–.

It can be said in favour of this chart that it does something to dispel the notion of Malta as merely a dot somewhere in the Mediterranean. The central portion of the chart is taken up by a large scale map of Malta, Gozo and Comino, showing the position of Valletta and many other settlements. Unfortunately, no scale is given; the shading presumably has something to do with relief, but appears to be quite unrelated to the rivers; and there is no explanation of the black lines (presumably roads). The inset map showing air distances is quite useful. The pictures, however, give little clue to life on the islands, and the notes are almost entirely divorced from both the pictures and the maps.

World Sea and Air Routes: 2 sheets, 24 × 19 in., 10/–.

Each of these consists of a world map on Mollweide's projection showing routes on which there are regular services, and a more detailed map of Western Europe. Surrounding the map are drawings of various types of ships or aircraft, and each chart also has a list of selected routes, with distances and times. These are useful charts, from which quite a lot could be learnt by interested pupils.

Bananas: 1 sheet, 24 × 19 in., 1/–.

This chart shows pictorially the cutting, collecting, shipping and ripening of bananas, while a map indicates the main Atlantic sources of the fruit and the sea routes by which they reach Britain. Although there are slight obscurities in two of the pictures, the charts tells a clear and interesting story.

Rice: 1 sheet, 24 × 19 in., 1/–.

This is a very useful chart, in the nature of a "flow diagram." Five stages in rice growing and harvesting are shown by pictures (some of them a little obscure). Then follow four diagrams showing the processes of cleaning, husking, scouring and polishing for the export market. Insets show the rice seed and plant in various stages of growth, and a world map indicates the rice growing areas.

Wall Charts. Pictorial Charts Unit, University of London Press, Ltd., Little Paul's House, Warwick Square, London, E.C.4.

British Farming: 2, A Dairy Farm; 3, An Arable Farm; 4, A Sheep Farm. 30 × 40 in. 5/– each.

These are all useful charts in that they show a large scale map of a farm, the appropriate distribution map of the British Isles, details of rotation and a calendar of a farmer's year. Each item in itself can help the teacher by providing information which is not always easily available ; but most teachers will want to deal with each item separately so that each will lead on to the next. Teachers are thus confronted with the inherent weakness of this type of wall chart, namely, that all the information is presented to the child at once and not in any desirable learning sequence. These charts can best serve as bases for individual or group work, with the children set to discover information about specified and limited topics.

Regions of the World : 4, Temperate Grasslands. 30 × 40 in. 6/6.

This chart shows a diagram of the distribution of temperate grasslands, the layout of a Canadian wheat farm and of an Argentine *estancia*, and other diagrams showing the climate of the Canadian Prairies (no location given), causes of crop failures, and the farmer's work through the year. The *estancia* diagram may be useful for detailed work but the Canadian farm is very poor and lacks both scale and key. It seems probable that one chart alone, cannot give an adequate idea of the temperate grasslands. It is certain that this chart does not.

Geography of the Netherlands. 44 Frames. Educational Productions, Ltd. Teachers' Notes Available.

This strip deals systematically with the geography of the Netherlands, having sections entitled, Position and Physical Features, Polders and Drainage, Agriculture, Rivers and Ports, Industry and People. Maps and diagrams of trade, land use, polders, etc., are included.

This is a very good strip. The photographs are of excellent quality and there are several striking low oblique aerials. The topic is very adequately covered and the notes are very useful indeed. This is a strip which can be thoroughly recommended for use in secondary schools.

The Geography of Greece. 42 Frames. Educational Productions, Ltd. Teachers' Notes Available.

This strip includes sections on Physical Features, Climate and Vegetation, History, Economic Life and Social Life ; and a number of maps and diagrams.

This is a useful strip and contains many interesting frames, although there are a few pictures of little teaching value. However, the whole strip will give a very adequate idea of the geography of Greece. The notes are useful and contain many interesting details. Recommended for secondary schools.

The Geography of South Africa : Strip 1, The South West. 44 Frames. Educational Productions, Ltd. Teachers' Notes Available.

This strip deals with the Countryside, Occupations in the Cape District, People, and Towns, of the south western part of the Union of South Africa.

Most of the frames in this strip have been well chosen and are very useful teaching pictures, although one or two in the " Countryside " section are open to criticism on the grounds of lack of detail which may help to localise them. This, however, is a small point when viewed against the general value of the strip. The notes are very useful indeed and the strip can well be recommended for secondary schools.

Australia : Strip 1, Southern Victoria and Tasmania. 45 frames. Strip 3, The Central Lowlands. 38 frames. Educational Productions, Ltd. Teachers' Notes Available.

Strip 1 has 28 frames on Southern Victoria, and 17 on Tasmania dealing with the physical features and economic geography. Strip 3 includes sections on Position and Relief, Climate and Vegetation, Stock Rearing and Agriculture, Minerals, Communications. Both include several maps and diagrams. The selection of photographs is sound and although a few of the frames are not likely to create much interest, the geography of these regions is well covered. The notes are very useful and enhance the value of these two strips to secondary school teachers.

Canada : Strip 5, British Columbia. 40 Frames. Educational Productions, Ltd. Teachers' Notes Available.

This strip is a straightforward account of the geography of British Columbia, and contains sections on Location, Relief, Climate, Historical Settlement, Products and Industries, Towns and Cities, Communications and Wild Life.

The quality of the photographs in this strip, is, in general, good, the pictures have been well chosen, and the geography of the province adequately covered. The notes are useful and provide a number of interesting teaching points. Some of the maps, however, have become overloaded by trying to include too much detail. A useful strip for secondary schools.

Air Routes of the World : Strip 1, England to Egypt. 28 Frames. Educational Productions, Ltd. Teachers' Notes Available.

This strip attempts to take the viewer on a flight from London to Cairo, and contains pictures illustrating customs formalities, the take-off and various aerial views of towns and scenery on the route.

The author states in his introduction that the strip is intended to facilitate " answers to the essential questions Where is it ? and How can one get there ? " One gains the impression, however, that although the strip may have a very limited value in the upper parts of primary schools and the lower forms in secondary modern schools, the proper use of the globe and atlas would better serve this stated purpose. Some of the pictures are interesting but several are of poor photographic quality, and add little to the pupils' understanding of the regions crossed during the flight. Indeed, with the exception of Egypt, the pictures in general will do little to assist the introduction to a detailed study of any particular region, to which the author refers in his introduction.

Meet your Neighbour : Strip 1, Where do you live ? 24 frames. Strip 2, What is your work ? 38 frames. Educational Productions, Ltd. Teachers' Notes Available.

Strip 1 shows pictures of various types of British dwellings ranging from a city scene to farm buildings, or a mining town. Strip 2 presents pictures of 38 British activities ranging from sheep farming to ship building, and from fishing to film production.

The pictures are, in general, clear and distinct, but it is difficult to suggest how strips of this nature are to be of use in the classroom. There is no connection between one frame and the next, and indeed each frame could easily be the starting point of a separate course of study; but the strip gives no pictorial material for such a development although there are some broad suggestions in the notes.

Yellow People. 26 Frames. Unicorn Head Visual Aids, Ltd. Teacher's Notes Available. Age Group : 9 plus.

Description : This is one of a series of six strips each intended to introduce children to a large group of peoples alike in skin colour. By means of 7 maps and 19 photographs it provides an introduction to the distribution of the Yellow Peoples and to the environments and occupations of some of them. Chinese, Uzbek, Finn and Eskimo are taken as typical, five or six frames being devoted to each.

Assessment : It is doubtful whether the maps—all on Gall's projection—can convey much of value to the children for whom the strip is intended. The pictures are of excellent photographic quality, but a few of them are difficult to interpret owing to smallness of scale. In some sections the selection is good, but it is unbalanced in others; two out of the four Finnish pictures suggest Lappland rather than Finland proper. It is of course important that children should be made acquainted with peoples whose environments differ markedly from their own. It is, however, very questionable whether the grouping of such peoples should be based on skin colour. Therefore, while each section of this strip contains good pictorial material, its use as a whole cannot be recommended.

Brown People. 24 Frames. Unicorn Head Visual Aids, Ltd. Teachers' Notes Available. Age Group : 9 plus.

Description : This strip, is on the same lines as that on the Yellow Peoples. An Egyptian Fellah, a Bedou, a North West Frontiersman and an Indian Plainsman are selected as typical Brown People.

Assessment : Although there is no division of mankind which cannot be scientifically classified as " brown," and although there is some doubt as to the the existence of the word " Bedou " there is, nevertheless, a better case for this strip than for that on Yellow People. The distribution of the peoples represented here is far more compact and their environments have more in common. The pictures are of high quality and many of the scenes shown are typical, though there is occasional disagreement between pictures and notes. The strip could provide material for several lessons and might be made to fit into an elementary " world " syllabus. The notes supply useful background information.

Peoples of Other Lands : Peoples of Africa. Common Ground, Ltd., Sydney Place, London, S.W.7. Teaching Notes available.

Content : This is the first of a new series of strips by Mr. L. J. Simpkin, the author of a magnificent series on economic geography for primary schools. Again the author has the needs and interests of the primary school in mind. This series illustrates the major climatic regions of the world by showing how climate influences the food, clothing, shelter and life of the native or immigrant population. The treatment is rather like that of a sample study. A story of a Bedouin Arab is followed by one about a Pigmy family and then by pictures of life in Basutoland. Desert, savannah and equatorial forest conditions are fully illustrated. The story of each region follows a similar pattern, and so makes comparisons very easy.

Assessment : This strip is characterised by magnificent photography and simplicity of treatment. It is obviously the result of careful experiment with children in the classroom, for each picture has something to attract children's interest and curiosity. Each series of pictures starts with a close-up of a person and then goes immediately to the environmental conditions, thus setting an interesting problem to be solved by a study of subsequent frames. There are a number of pictures of children which provide an added interest for primary school children. It is to be hoped that other strips in this series will be published soon. The teaching notes are of the high quality usual with Common Ground, Ltd.

The English Lake District, Part I : 41 Frames. Part II : 32 Frames. Unicorn Head Visual Aids, Ltd. Teachers' Notes Available. Age Group not stated.

Description : Each of the two parts describes a series of day trips from Grasmere. In both parts the route of each trip is shown on the map.

Assessment : This is not a teaching film strip, though it contains an excellent number of photographs which could be used for teaching purposes. The notes accompanying it are styled " Lecture Notes " and they could be read verbatim as a popular lecture illustrated by the strip. The maps are poor, lack any clue to their shading, have inadequate and sometimes badly-placed names, and inaccuracies in the routes. Pictorially the various routes are treated very unequally. The emphasis is mainly on scenery, described in the notes in flowery guide-book style ; but there is little or no attempt to relate the many features named to the essential arrangement of the relief, to natural routes, to geographical processes or to land use. Each section might be used as a preparation for—or a reminiscence of—the particular trip with which it is concerned ; but for teaching the geography of the Lake District the strip has little value.

Swiss Alps. Common Ground, Ltd., Sydney Place, London, S.W.7. Teachers' Notes available.

Content : This strip, consisting of 3 maps and 46 pictures, is divided into two main sections : Tessin (21 frames) and Bernese Oberland (27 frames). Each of these is subdivided into three parts : Scenery, Occupations, Settlements.

Assessment : The object of this strip is to contrast the northern and the southern valleys of the Alps by means of sample studies of two type areas. The method is chosen in preference to that of making a general selection of pictures from all parts, and it has the advantage of focusing attention on typical features of two well-defined and restricted areas within each of which the locations mentioned can be easily identified. For the purposes of secondary school geography, for which this strip is intended, this approach has much to commend it. The contrasts between the two districts in regard to the main components of relief, the siting of settlements, their layout and building styles, and the use made of the land—all reflecting climatic influences—are well brought out, while the common dependence on the tourist industry is lightly touched upon. What is perhaps less satisfactory is the use of Tessin to typify part of the *Swiss* Alps, when it is but a small fragment of the southern slopes and is, in all but political allegiance, typically Italian. The pictures lend themselves to pertinent questioning, and their significant details are, with a few exceptions, easily seen and appreciated. It is possible, however, to criticise one or two of them on grounds of multiplicity of detail, difficult angle, or obscurity. The notes are commendably concise and relevant.

Map Making. (A) The Village. 40 Frames. Unicorn Head Visual Aids, Ltd., Broadway Chambers, 40, The Broadway, London, S.W.1. Teachers' Notes available. Age Range: 8–10 years.

Description: This strip is divided into five sections:—The Village; The Classroom; The Way to School; The Farm; The Post Office and General Store. Each contains views of an imaginary village and of some of its component buildings, and in three of the sections these lead up to the drawing of a map. A boy living at a farm and a girl living at the Post Office are introduced, and the strip claims to show how map-making can be derived from the children's daily experiences and activities.

Assessment: Two main criticisms may be levelled at this and the two succeeding film strips. In the first place it may be seriously questioned whether the approach to map-making is, in any circumstances, best made through pictures of a purely imaginary area. Secondly, in these strips, the pictures, though clearly drawn and well reproduced, are crude and unrealistic. Those of the village are misleading to a town child, and liable to arouse scorn or amusement in a country child. In many more detailed ways this strip is unsatisfactory. Thus, although the plan of the classroom is correctly—if somewhat painfully developed from perspective views, this is not followed up in the plan of the village streets, which correspond to an oblique and not a vertical view. The sequence formed by the last 12 frames has little to do with map-making.

Map Making. (B) The Town. 38 Frames. Unicorn Head Visual Aids, Ltd. Teachers' Notes Available. Age Range: 13–15 years.

Description: This strip is arranged in four sections: The Bus Journey from Village to Town; The Town; The Homes of the Town Children; Return Journey of the Village Children. The method is similar to that of the preceding strip, and aims to show how map-making can be further advanced.

Assessment: It is difficult to believe that this strip is intended for children five years older than those for whom the "Village" Strip was made. The only advance is in the extension of the distance—one can hardly say area—covered. There is no development of style, and no plan of any building—such as the town school or the railway station—or of any area of the town. Correlation between pictures and maps of the route from the village to town is made difficult by differences of orientation and the omission from the maps of simple key features, such as, for example, a road junction. The pictures have all the same defects as those in strip (A), and little or no use is made of the majority of them for the purpose of map-making.

Map Making. (C) The Big City. 35 Frames. Unicorn Head Visual Aids, Ltd. Teachers' Notes Available. Age range not stated.

Description: This strip follows similar lines, being divided into four sections: The Journey from Town to City; The Home of the City Children; Visit to City Children's Father; The Return Journey.

Assessment: In an introductory note referring to the two preceding strips it is stated: "In these film strips it was shown how sketch maps could be drawn by following certain simple principles and by keen observation. This is also the main point of this film strip. It culminates in very simple sketch maps, but teachers who feel that their pupils can do more advanced work . . . are afforded ample material for the purpose." It is, unfortunately, difficult to trace any constantly applied principles; and an examination of this strip fails to sustain the claim made in the last sentence of the note. There is material of a kind, but how to turn it into maps—apart from merely copying parts of the wall map in Father's office or the so-called "Ordnance Survey" map—would puzzle the most intelligent pupil.

The reviewers feel that if there is any case at all for the production of film-strips on this subject it must depend on more realistic pictures and much closer correlation between pictures and maps. But a child's observation of his own environment gives a far sounder foundation for map-making.

REVIEWS OF BOOKS

WITH very rare exceptions, books reviewed in this journal may be borrowed from the Library by full members or student library members of the Association.

Buckinghamshire (The County Books). Alison Uttley. 13·1 × 22·3 cm. xxvi + 415 pp. London. Robert Hale, Ltd. 1950. 15/–.

Mrs. Uttley explains that when she was asked to write a book about Buckinghamshire in the new county series, she hesitated. She knew little of the geology, geography, archaeology or history of the county and rightly felt diffident of attempting to say something fresh. As a countrywoman, however, she decided to write her personal impressions of the countryside and its people. The book runs to 409 pages and much industry has gone into the collection of these impressions. In places one wonders, indeed, if the collection has not become a miser's hoard from which the writer is unable to throw anything away. We need a skilful intermingling of word pictures and Baedeker facts. But Mrs. Uttley is not careful enough. She rises to eloquence and drops into bathos. " There is a bed of white violets in the deep moss-lined window of the porch, and wild cherry blossom from the woods hangs in tumultuous foam by the altar. Daffodils fill the leaden font, one of the few lead fonts in the country." Those who have enjoyed Mrs. Uttley's other books will feel that she has attempted to write beyond her range. It is a disappointing book and the map is very poor indeed.

G.J.F.

Hertfordshire. Sir William Beach Thomas. 13·7 × 21·9 cm. viii + 270 pp. London: Robert Hale, Ltd. 1950. 15/–.

This is a worthy representative of the series of County Books. It is magnificently illustrated but the outstanding impression one gets from it is the charm, knowledge and understanding with which it has been written. The author sums up the essential qualities of Hertfordshire as " a rich continuity of history and a wholly English character." The pages which unfold this picture are rich with anecdote and mellow with wisdom and comment. The naturalist is also deeply rooted in the past, not in a prosy academic way but in those roots which through time have nourished the present. Of Letchworth and Welwyn Garden City he writes " they have proved successful but they have not approached the quality of the English village, which is the most perfect social unit in the world." That is an article of faith perhaps in this 20th century, more true possibly of Hertfordshire than many other regions of England. In this book the land, its villages, its life and its people come close to one. A.D.

The Place-Names of Cumberland. Parts I and II: (English Place-Name Society, vols. xx and xxi). A. M. Armstrong, A. Mawer, F. M. Stenton and Bruce Dickins. 13·9 × 22·3 cm. vi + 258 pp. (Part I) and 199 pp. (Part II). Cambridge: The University Press. 1950. 18/– each.

As the general editor, Professor Bruce Dickins, says in his note introducing Part I, " the work has been produced in evil times." Though most of the material had been collected before the outbreak of war, the copy for Parts I and II was only sent to press late in 1946, and Part III has still not been published. Because of greatly increased costs, the English Place-Name Society have been forced, if the subscription was not to be raised, to produce much smaller yearly volumes than hitherto, which is why it was found necessary to divide *The Place-Names of Cumberland* into three parts. The result, however, has been unfortunate to the users of the two parts already published.

Part I, besides a Note by the General Editor, contains the Baronies, River Names, Lake Names, Forests and Miscellaneous Names of Cumberland, together with the place-names and field names of Eskdale, Cumberland and Leath Wards. Part II contains the place-names and field names of the Wards of Allerdale below Derwent and Allerdale above Derwent. But what is described as " a long Introduction and the usual preliminary matter," an Appendix on the Romano-British names of Cumberland, a List of Elements *and the Index* have all been relegated to Part III. And without certain of the introductory material (for example, notes on the arrangement of the material, and in particular of the field-names which in previous volumes have been placed in a separate section towards the end of the volume) and, more especially, without the index, the two parts already published are very nearly useless as works of reference.

It is to be hoped that the third volume will very soon be published. It will then be possible to assess more accurately the value of the two parts which have already appeared and which have every appearance of upholding the high standard previously attained by the publications of the English Place-Name Society. I.S.M.

Forgotten Ports of England. George Goldsmith Carter. 15 × 23 cm. x + 206 pp. London: Evans Bros., Ltd. 1951. 21/-.

Fascinating themes in our historical geography are provided by the "lost" and "forgotten" seaports of England, and it is to the latter that Mr. G. G. Carter directs our attention. Perhaps "forgotten" is the wrong epithet: the point rather is that, once vigorous and significant in our maritime life, these ports have either ceased so to function or have now only a local activity confined to coastwise and up-river traffic. Mr. Carter has in no sense attempted to write a systematic account of these old ports, for he is writing for the general reader not the student. He can rightly claim to have written a lively and readable, if discursive and superficial narrative of them as they appeared to him, an experienced seaman temporarily turned landlubber, when he visited them recently, armed with a camera and a curiosity which local inhabitants, wise in old lore, did much, in and out of village inns, to satisfy.

Forgotten Ports of England describes our old ports from East Anglia round to Sussex, let us say from Dunwich to Winchelsea, and does this in the light of history and legend from Roman times onwards. The ignorant reader might well be in some doubt as to why these once flourishing ports have either disappeared or become fossil features of the geography of our coastlands. It is true that Mr. Carter has much to say about the physical changes which worked against their survival or their fortunes, but the no less fundamental economic changes are virtually ignored. Mr. Carter, it would appear, has tried to arouse the interest of the holiday-maker to our coasts in their visible antiquities. Readers will differ in their reactions to his preference for the more macabre incidents of local history rather than the more humdrum normalities. They will probably agree that he writes at times with a skill and vividness which owe something to his knowledge of, and feeling for the sea. The book contains some reproductions of old maps and many excellent photographs. These are successful not only in evoking the past but also in pointing to pleasures still available to those with eyes to see and appreciate the past which is still present in the English coastlands, W.G.E.

An Atlas of Tudor England and Wales. E. G. R. Taylor. 12·5 × 18·25 cm. 32 + 40 pp. London: Penguin Books Ltd. 1951. 3/6.

This book (a King Penguin) is divided into two parts—28 pages of introductory matter by Professor E. G. R. Taylor and 40 pages of maps reproduced from John Speed's Pocket Atlas of 1627. In her introduction, the author begins with a short discussion of some of the more important English and Dutch cartographers of Tudor times and shows the relevance of their work to Speed's Atlas. In this atlas, as Professor Taylor points out, we have in all essentials a set of Elizabethan county maps.

Having, in general terms, considered certain aspects of the Tudor landscape, the book then goes on to a more detailed consideration of the English counties (which have, for convenience of reference, been arranged alphabetically). An attempt is made to portray the salient characteristics of each county by quotations from what appear to be contemporary sources. Inevitably, though sometimes picturesque, such descriptions tend to be in vague and general terms. Thus, Cambridgeshire is summed up in these words, " 'The soile doth differ both in ayre and commoditie: the Fenny is surcharged with waters: the South is Champion and yeildeth Corn in abundance, with Meadowing-Pastures on both sides of the River Cam, upon whose east banke the Muses have built their most sacred seat.' The Fens, although aguish, abounded in pike, eel and duck, the water-fowl so cheap, said an ancient writer, that five men could be satisfied for one halfpenny. Of all this wild plenteousness the Drainage was to make an end." Instead of such vague descriptions, it would surely have been of more use if Professor Taylor had told us such things as the relationship of the size of the originals in Speed's Atlas to the maps reproduced in this volume.

For the second portion of the book, with its reproduction of Speed's maps, there can be nothing but praise—always providing, of course, that the reproductions are accurate, and this the reviewer is unable to check, not having access to the originals. But, without exception, the maps are clear and the colouring is pleasing. This little book is very good value for 3/6 and should appeal to all who are interested in the early maps of this country. I.S.M.

Journeys in England: An Anthology. Jack Simmons (Ed.). 21·5 × 14 cm. 288 pp. London: Odhams Press, Ltd. 1951. 15/-.

Admirably adjusted to the tastes of both historian and geographer, Professor Simmons'unusual anthology provides first-class material for all who combine an interest in the past and in the English scene. Its purpose is to provide a prose and to a lesser extent, a poetical anthology of travel in England hung "on a series of themes." That the themes will be discernible "to a reader who is interested," provides an initial sense of excitement which, in reading the book to discover these themes, never flags. Professor Simmons writes an excellent but too brief summary of some features of English travel and communications (and the reviewer at least would have liked a longer introduction on these lines). It is followed by excerpts, long and short, almost all of authentic journeys made from the 14th to the 20th century. They range from Chaucer to Edward Thomas, from Kemp to Hardy. They take us by stage-coach, and bus, by turnpike, by water, by rail and not least, for the casual shorter journeys, on foot. They range widely over England, over many counties, and over rural and industrial scenes. They cover the prosaic and the "marvellous." They give us our fill of historical, geographical and human interest and at the same time satisfy the aesthetic sense.
D.S.

The Heart of Scotland. George Blake. 21 × 14 cm. xii + 116 pp. London: B. T. Basford, Ltd. 1951. 12/6.

In the avalanche of books on every aspect of Scotland, most mainly designed for the overseas tourist, Mr. Blake's third edition of a book originally published in 1934, is conspicuous for its breadth of view, insight and understanding of the Scots and Scotland. He avoids the usual sentimentality and fulsome flattery, and takes an unbiassed view of the Scottish people, their traditions and ways of thought. And Mr. Blake has courage, too, when he writes: "If one can imagine Princes Street existing in space as a thing by itself, there would be nothing but derision for it, as an aesthetic entity." Or again: "It is really a lamentable row of buildings that faces the Castle Rock, even a disgrace." But he adds "That Scotland has one of the loveliest capitals in Europe is the merest commonplace, taken for granted." On another page he says that "the excellence of Scottish education is a legend, but one which it may be feared, is now with Nineveh and Tyre." True, but legends die hard. Of all the fascinating chapters, probably the best is that on the four large Scottish cities: their contrasts and their individualities. These are well analysed, and the rather foolish but irradicable rivalry between Edinburgh and Glasgow is not overlooked but rather underlined: "Glasgow is a magnificent slattern; Edinburgh is for the most part a trim and tidy matron." The fued, he thinks, is racial: we prefer to regard it as economic in the main. Aberdeen in its isolation, he rightly thinks, is the most Scottish of the large towns. Mr. Blake knows his own countrymen and has written a book that will be very welcome, especially to Scots in exile. The many illustrations are excellent. R.N.R.B.

Leinster, Munster and Connaught. (The County Books). Frank O'Connor. 13·6 × 22·1 cm. viii + 295 pp. London: Robert Hale, Ltd. 1950. 15/-.

This is an outstanding addition to the County Books Series. Mr. O'Connor has solved the difficult problem of presenting Leinster, Munster and Connaught in one volume, by a judicious selection of material and the result is a work of great literary merit, mainly historical in content, though containing many pertinent comments on the contemporary scene. In each county, certain buildings and places are chosen and their historical associations treated in detail.

In Dublin, St. Patrick's Cathedral leads naturally to a discussion on Dean Swift; Belvedere College to James Joyce; and the Abbey Theatre, of which O'Connor was for a time a director, to Lady Gregory and Yeats.

From Dublin, Mr. O'Connor turns his attention south to the remains of the monastic settlement at Glendalough; and west, to County Kildare, where the great houses of the Anglo-Irish bring the reader back to the troubled times of the 18th century. Cashel, in Tipperary, is the focal point for a dissertation on Irish mediaeval history and the neighbouring county of Kilkenny is justly described as one of the loveliest in Ireland. North of Dublin, the remarkable prehistoric remains along the Boyne Valley and the royal residence at Tara, now little more than a grass covered hill, give Mr. O'Connor an opportunity to relate some of the beautiful but little known Irish sagas associated with these two places.

The seaboard counties of the south and west of Ireland are referred to as centres of European civilisation linked by long tracts of wilder country where the Gaelic way of life has, to a greater or less degree, continued to the present day. Cork, where Mr. O'Connor was born and educated, brings memories of his childhood days; and Galway and the bleak landscape of Connemara inspire him to talk of poetry, magic spells and fairies. Donegal, though in Ulster, also comes within the scope of this book and is admirably treated, but the Midlands are apparently of little interest to the author and are summarily dismissed in ten pages.

Mr. O'Connor touches on almost every aspect of Irish life. His observations though accurate on the whole, are not always objective and sometimes cynical. This is, nevertheless, an ideal book for anyone who wishes to understand modern Ireland and, though not a guide book, it can be read with pleasure and profit by all who contemplate visiting the country. There are numerous excellent photographs, a general map of Ireland and an adequate index. J.P.H.

British Farming. Ministry of Agriculture and Fisheries. 17·5 × 25 cm. 96 pp. London: His Majesty's Stationery Office. 1951. 3/6.

British Farming is a descriptive account of British farming systems written by W. B. Mercer, Provincial Director of the West Midland Province of the National Agricultural Advisory Service, with the collaboration of eight other agricultural officers. It is clearly and interestingly written in Mercer's well-known style, and the narrative impells the reader to complete it at a sitting. It is beautifully illustrated with well chosen photographs, some of the landscapes having a fine decorative quality. It is, of course, completely up-to-date, for agricultural officers are in contact with current developments and with pioneer experimental farming.

The contemporary period is one of marked change in farming technique, and one of the main objects of this account is to display the nature and extent of change. A period of change tends to be one in which regional farming systems tend to lose their sharpness of definition until the new techniques settle down and become characteristic of those areas to which they are best adapted. It is natural that agricultural officers should be most mindful of techniques and least mindful of the more permanent and fixed attributes of landscape, soil and climate. Mercer resists this temptation, and has an eye for the effect of physical factors and for the character of regional farming systems. There is, therefore, a good deal of agricultural geography as well as of agricultural science in *British Farming*, but it does not pretend to be a regional agricultural geography such as a geographer would write. It has regional references but not a regional arrangement; it has maps but they are illustrations rather than an integral part of the argument; and the map on page 52, which shows additions to ploughland during the late war, would have benefited greatly from a geographer's advice. At times it appears to give an impression of almost unlimited possibilities of improvement in agricultural output, which the authors in daily contact with the land and its climate are too experienced to wish to convey. W.S.

Geography of Russia. N. T. Mirov. 15 × 23½ cm. xii + 362 pp. London: Chapman & Hall, Ltd. (New York: John Wiley & Sons.) 1951. 52/-.

This handsomely produced college text concentrates attention, although not exclusively, on the physical geography of the U.S.S.R. Dr. Mirov's reason for excluding the economic geography, namely that the economic data are inadequate, is not wholly convincing, but no apology is of course necessary for an introductory study on the physiography and biogeography of so extensive an area as the Soviet Union. This book usefully supplements available English texts on the geography of Russia.

Dr. Mirov, born and educated in Russia and now an American citizen, has been able to draw upon his own personal knowledge, while he has made much use of Russian textbooks and monographs, as also of the *Great Soviet Atlas*, here available only in a few libraries. The text is carefully and lucidly written, and the map illustration uniformly clear and helpful. The book should not deter the unspecialised geographer: special care has been taken to define terms (in particular Russian terms and names), while the complexities and unresolved problems of Soviet geomorphology (which must be many) are not brought into the discussion. Useful features of this book are the many tables of figures (especially on climate) and the close attention paid to plant geography.

The first two parts of the book deal very briefly with the basic facts of the physical setting and of the human (including historical) background. Part III occupying three-quarters if the book, presents a survey of the major physico-biological regions. Mirov notes (p. 85) Dokuchaev's recognition, as long ago as 1898, of the broad soil-and-vegetation belts of Eurasia, and follows with little modification the more recent classification along similar lines drawn up by the eminent Russian scientist, L. S. Berg. Mirov thus reaches a division of the U.S.S.R. into 20 " geographical regions " (Map 16, p. 87), although this might not seem the most fitting term to apply to divisions (large and diversified as they are) which are based solely on physical and ecological criteria.

The successive chapters deal systematically with these " regions " which will be broadly familiar to unspecialised readers from their knowledge of General (or World) Geography: tundra, taiga, mixed forest, " woodland " (wooded steppe), " prairie " (steppe)—these terms are not strictly interchangeable—and so on. Mountain regions are discussed in several chapters, as well as Pacific and Arctic island territories. In each regional chapter the author writes in turn of climate, topography (meaning relief), soils and vegetation, animal life, and (lastly and very briefly) the people.

A few details may be noted. The term " Middle Asia "—to include Kazakhstan and Soviet Central Asia—has become Soviet usage, the term " Central Asia," being reserved for non-Soviet territories. Map 1 is interesting as showing clearly the strategical implication of the much publicised Osh-Khorog highway across the Pamir ; the text (p. 5) does not, however, make clear that the Soviet-Pakistan boundary in the Wankan panhandle is undemarcated.

W.G.E.

Geography of the U.S.S.R. A Regional Survey. Thedore Shabad. 16 × 24·5 cm. xxxii + 584 pp. London: Oxford University Press. 1951. 42/–.

Geographies of the U.S.S.R. seldom wholly fulfil expectations since it is scarcely possible within a single volume to discuss all aspects. Mr. Shabad has attempted here an " up-to-date " regional survey. At considerable pains and with some success he has included much recent information about population, cities, industrial developments and the political organisation of Soviet territory. While he has not sought to establish and describe " economic regions " in terms of economic distributions and relationships, he has avoided the familiar approach by way of the main zones of broadly uniform soil and vegetation. Indeed, after an introductory account of physical, political and economic patterns, the author discusses successively the geography of the politico-administrative divisions of the Union. This plan, while it makes use of ready-made regional units which of course are not co-extensive with economic regions, has much to recommend it. First, it makes this book very convenient for reference by readers familiar with the politico-administrative structure of the Union's territory, a map of which should have been included to help the uninitiated. Second, it is evident that in the U.S.S.R. politically centralised planning lies behind the economic activities which in turn are continually changing the geography of population, settlement, agriculture, industry and transport. And by close attention to the politico-administrative map as it changes, Mr. Shabad is able to show that much of geographical interest can be learnt, for example, about the distribution of population, the rise of new towns and new industrial undertakings. Use in particular has been made of election lists for administrative areas to estimate demographic changes since the last census (1939). In short, Mr. Shabad's work is well organised and useful, above all for the picture which it gives of the contemporary economic and political geography. The reader will find here, for example, a clear answer to the question how the U.S.S.R. has organised politically the territories which it gained in Europe and in Asia during the second world war.

In certain respects this book offers less than might have been expected. The reader is not given a very clear idea of the actual production of the major industrial and agricultural commodities, although the 1950 plan figures have long been available (the figures of production actually achieved in that year, now available, were not of course to hand when this book went to press). Very little is told about the tin industry, although substantial production in Siberian Arctic areas has been reported in the Soviet press. It is not wholly clear why Mr. Shabad did not include in Table 2 the 1939 figures for the population of administrative areas—these would have been useful for reference. Finally, while the sketch-maps are clearly drawn and useful for locating areas and places, they fall short of what is now expected in geographers' maps. For example, no attempt has been made to differentiate towns on the basis of their populations, or to show single-track, double-track and electrified railways ; nor do any maps show relief features or other physical patterns relevant to the economic geography. W.G.E.

Weather in the Indian Ocean to Latitude 30° South, and Longitude 95° East, including in the Red Sea and the Persian Gulf. Volume II. Local Information. Part 1. Red Sea. Air Ministry, Met. Office. M.O. 451b (1). 15·5 × 24·5 cm. 109 pp. London : H.M.S.O. 1952. 7/6.

This publication forms part of the handbook on " Weather in the Indian Ocean " prepared primarily for the use of Meteorological Officers on H.M. Ships. It describes briefly the physical features of the region and the general weather to be expected at selected representative stations, and gives a more detailed discussion of pressure and fronts, surface and upper winds, visibility, precipitation, temperature and humidity. There are detailed climatological tables for 13 stations with supplementary tables of wind direction and force, visibility, height of base of low cloud and upper air temperatures and humidity.

The text is well illustrated by figures showing the geographical distribution and annual diurnal variation of the several meteorological elements. N.P.

Statistical Atlas of Bombay State. (Provincial Part). 1950. 25 × 34 cm. v + 228 pp. Bombay : Bureau of Economics and Statistics. 1950. Rs.40. (Including supplement : Estimates of Areas under Crops in Bombay State, 1948–49.)

The first edition of this atlas was published in 1888 and was prepared essentially for the purpose of providing statistical and cartographic data to help those concerned with combating famine in Bombay Presidency. The present (fourth) edition has been considerably increased in scope to include all data of economic interest. For this reason it was considered desirable to publish the atlas in two parts—the Provincial Part containing information about the state as a whole, with Districts as units, and the District Part containing detailed information about the Talukas. While the material for this edition was being collected, the incorporation of many Indian States into Bombay Presidency took place, with the result that publication of the District Part of the atlas has been deferred until comparable data for the former Indian States were available. Despite the title-page, the preface to this edition also points out that the words " Bombay Province " could not be replaced by the words " Bombay State " because the material for the atlas was already in print before the new constitution was inaugurated.

This work is much more than simply a statistical atlas in the ordinary sense of the term because, in addition to over 60 maps, there are extensive notes on the topics mapped as well as 11 appendices and 25 statistical tables.

The notes are arranged under four main headings. Firstly, there is a discussion of the geographical features, and this deals with general features, the physical setting (geology, relief, drainage, mineral resources, climate, land utilisation and vegetation) and the geographical regions of Bombay Province. Secondly, there is a section dealing with agriculture under the three headings of land utilisation, crops and notes on related topics (irrigation, land tenure, tenancy and wholesale prices). This is followed by a section on industrial development and including industrial labour, trade unionism, a review of industries and notes on related topics (power resources, transport facilities, trade and finance, etc.) The last portion is concerned with demographic and social trends under the headings of area and population, public health, literacy and education, and occupation.

When it is remembered that the discussion of these topics is amplified in most cases by maps and statistical tables it will be realised that this volume contains a very great amount of valuable, detailed information on this part of the Dominion of India. It is, therefore, all the more unfortunate that correction of the numerous mistakes that have been noted by the publishers should have taken the form, not of bringing out a revised edition, but of sticking in lists of corrigenda, of sticking new figures over portions of statistical tables and even of making manuscript amendments. Likewise, the maps, though useful, could in many cases have been improved a great deal cartographically. Nevertheless, despite these imperfections, this is a reference book of very great value to the geographer. I.S.M.

Sudan Geography. Robin A. Hodgkin. 13 × 19 cm. x + 190 pp. London: Longmans Green & Co., Ltd. 1951. 6/6.

This volume sets a new standard for elementary textbooks on the geography of tropical territories.

In many past texts heavy reliance upon second- and third-hand material, combined with the inclusion of much irrelevant but space-filling general discussion, effectively kills the interest of both pupils and general readers in the course of the first few pages. In "Sudan Geography" material of a general character is reduced to a minimum and the greater part of the book consists of detailed factual descriptions, based upon first-hand knowledge, of the ways of life of the peoples of the Sudan. Descriptions of the contrasting regional landscapes—the northern deserts, the hilly areas of the central Sudan, the swamps and forests of the south—form the background to these accounts and provide the author with an opportunity to introduce a brief treatment of such topics as water supply and arid erosion. The style, though of necessity simple, is clear and vigorous, with the clarity and vigour that come from first hand observation. Numerous maps, photographs and line sketches are of special value to the non-Sudanese reader.

The question of approach is scarcely less important than that of factual content in texts dealing with dependent or under-developed areas. Too often, problems are discussed against a purely European and urban scale of values and with little of that understanding of local needs which only long residence in a territory can give. Such an approach gives at the best an oversimplified picture whose lack of contact with reality impairs the confidence of the overseas student; at the worst it may be both misleading and dangerous. By contrast, one of the outstanding merits of the present volume is its sensitive appreciation of local problems as seen through Sudanese eyes. One may not agree with the author's observations on the role of urban centres or on the prosperity of the Sudan; they do, however, put a point of view too often neglected, and one which it is good to hear. And it is good to have the writer's description of the satisfactions of Kabbabish or Baggara life; not only does this add to the vividness of the text, it draws attention to some of those intangible psychological elements in the pattern of African life which the enthusiastic western planner so frequently overlooks or disregards.

"No one can get to love a country without seeing it properly: all true affection rests upon vision. Vision again rests on knowledge . . ." Thus the late Sir Douglas Newbold in his inaugural lecture to the Sudan Cultural Centre. In the light of this quotation, Mr. Hodgkin is to be congratulated on providing, not only a much-needed human geography of the Territory, but a volume which may be regarded as an essential primer of Sudanese citizenship; in it both Sudanese and non-Sudanese readers will find a guide to the better understanding of one of the most complex and fascinating African territories. K.M.B.

Fourteen Men.—The story of the Australian Antarctic Expedition to Heard Island. Arthur Scholes. 22 × 14 cm. 273 pp. London: Allen & Unwin. 1951. 15/–.

In furtherance of her political claims in the Antarctic, Australia decided to found an observatory and biological station on Heard Island, an almost unknown and most unapproachable volcanic island of about 135 square miles, 1,000 miles north of the Antarctic continent, about 90° E, not very far from Kerguelen. The island has been known only for about a century and has never been properly mapped. The *Challenger* visited it for a few hours in 1874, and the German Antarctic Expedition was there in 1902. It lies in the belt of southern cyclones and has a full share of gales, rain and snow, so that on most days landing is very dangerous. There is little vegetation, but much seal and bird life. It is difficult to avoid monotony in writing of 15 months in such a dreary place, but Mr. Scholes, who was the radio operator, makes a strong attempt and his book is cheerful, light-hearted and readable, even if it adds little to our knowledge of the Antarctic. R.N.R.B.

New Zealand—Weather and Climate. New Zealand Geographical Society—Special Publication, Miscellaneous Series, No. 1. B. J. Garnier (Ed.). 15·5 × 24 cm. v + 154 pp. Christchurch and London: Whitcombe & Tombs, Ltd. 1950.

This informative publication comprises five separate essays by different authors, the separate sections supporting each other very well with little repetition.

The growth and organisation of weather observation in New Zealand and the movement of air masses over this area are described in the first two essays while the long middle section analyses the separate climatic elements. From the geographical point of view, however, the last two essays are the most valuable. Here Thornthwaite's classification is applied successfully to yet another country.

The text is well supported by maps and diagrams and the comprehensive bibliography adds materially to the value of the book. The whole work would be much more readable, however, if a map showing all the places mentioned in the text had been included. Nevertheless, here is a valuable addition to the small number of reference works on the climatology of the southern hemisphere. S.R.E.

Essentials of Geography. O. W. Freeman and H. F. Raup. 18.5 × 26 cm. vii + 487 pp. New York: McGraw-Hill Book Co. 1949. 42/6.

Despite its expensive, modern and not unattractive façade this must be classed as an Old-Curiosity-Shop geography. True, as one enters, the doorbell sounds an ominous note—" Geography has become an inclusive and acquisitive science "—yet the subsequent realisation that the authors really mean this to be taken literally nevertheless comes as a profound shock.

It can be claimed, of course, that despite appearances this is intended to be a very elementary text—" a basic text for introductory courses . . . practical and simple in its presentation." Some of the questions (just a little ostentatiously called Problems) which follow each chapter certainly bear this out—" How many trips have you made round the sun ? "—" What determines whether a current is called ' warm ' or ' cold ' ? "—to say nothing of " What are some possibilities for recreational activities on plains ? " On this view the short staccato sentences of the text may well result from the conscious attempt to " write down " to the young reader. This attempt would have been more felicitous if the relationship between one sentence and the next had often been more obvious.

Yet rubbing shoulders with these " Problems " is a list of " Selected References " that would grace a full Honours course. Are we not justified then in placing this work beside Finch and Trewartha's *Elements* or James's *Outline* ? In such a setting its lack of authority is all too clearly revealed. This is not so much the result of downright error, though some of the climatology is decidedly weak, as of careless phrasing and loose thinking, faults all the more regrettable in a textbook since they form such a large proportion of each student's natural endowment of original sin. Thus—" Fishing is a hard dangerous work and breeds a hardy and resourceful people who are the most capable sailors in the world " (p. 274)—" Certain inventions led to the concentration of population in cities " (p. 427)—" People move from place to place, thus redistributing human residence and activity to new and possibly unpopulated parts " (p. 409)—and the whole paragraph on pages 368–9: " Sometimes conditions and factors that affect manufacturing change, sources of material are exhausted, new materials both raw and partly processed may become available, or market demands may vary. These changes are reflected in the closing and opening of plants, modification of products manufactured, and increase or decrease in population of the affected communities." Such sentences will find varying degrees of acceptance among geographers, yet they are important for us all since they raise, in more or less acute form, the still unanswered question, " What is the nature of the valid generalisation in geography ? " Surely it is possible to distinguish between geographical truth and geographical truism !

Our authors find this distinction beyond their powers. Is it because being inclusive in their approach and acquisitive in their method they have neither a discipline nor a philosophy to provide them with a sense of values ? P.R.C.

Maps : Topographical and Statistical. T. W. Birch. 17 × 24 cm. xiv + 240 pp. London : Oxford University Press. 1949. 15/–.

This volume might be more aptly named " The Bumper Book of Cartography," for within its 217 pages of text nearly all aspects of cartography are dealt with. In attempting to cover such a wide field the author has necessarily had to be brief, and each chapter can be only an introduction to its topic. The book is thus well suited to readers seeking a general introductory knowledge to the subject, and in this respect is useful to senior pupils of grammar schools and to university students taking a course in cartography but not specialising in geography. It is very readable, and written in a simple style with touches of humour that help to sustain interest even in the drier sections.

In trying to be concise the author sometimes fails to make his points clear ; for example, the rather jumbled description of the one-inch O.S. map on pages 13 and 14 could be extended with advantage. Even in the first chapter on the history of mapping the main stages of development are far from clear and one is blinded by a mass of facts. There is duplication in the introductory parts of chapters II and III.

It is in the chapters on surveying that the author is most successful. Written descriptions of how to survey can be very dry and heavy to read, but in this book the simplicity of the presentation, the numerous little hints, and the small touches of humour serve to hold the reader's interest. Much the same may be said of the chapters on map projections, though here again they are merely introductory to the principles of construction and the varying properties of each.

The second part of the book, devoted to statistical mapping, gives a fairly full treatment of the various methods, though the illustrations are much poorer than in the first half : it is hoped that Figs. 95 and 96 are not supposed to be the best examples of the drawing of the methods they show. The chapter headed Diagrams and Diagram Maps lacks imagination and fails to treat many of the important but less obvious applications of such graphic representations.

Despite all shortcomings the book is a worthy attempt to cover a very wide subject within two covers. For the general reader or the senior pupil it whets interest sufficiently to make further exploration of the subject seem desirable.

R.E.H.M.

The Principles of Air Navigation. E. W. Anderson. 22 × 14½ cm. xiii + 264 pp. London : Methuen & Co., Ltd. 1950. 25/–.

In this book, written by one of the most highly qualified navigators in the Royal Air Force, the principles of that most exacting yet fascinating " business of conducting an aircraft on its ways " are explained with a refreshing clarity and precision. This is no theoretical treatise, but a manual written for airmen by an experienced, practising air navigator. That is not to imply that the theories behind the techniques and " black boxes " used by the navigator are disregarded : they are, in fact, dealt with in the realistic and convincing manner of a teacher who has learned by experience. The book has all the attributes of a " well-organised " text : it is divided into five parts—Physics, Equipment, Flight Planning, Position Finding, Air Navigation—each of which comprises from two to five chapters. Paragraphs are numbered and there are many helpful diagrams and a comprehensive index.

Although it is unlikely that the geographer will have occasion to make practical use of the manual there are two reasons why he should be aware of its existence. First, much of the stock-in-trade of the air navigator lies on the periphery of his own subject, if not, like a knowledge of the characteristics and properties of maps, charts and projections (chap. III) and pressure systems (chap. VI), wholly within its legitimate field. Secondly, the technique of air navigation, the equipment available to the modern navigator and the problems with which he has to contend merit as much consideration as do the techniques, equipment and problems of the navigators of the Great Age of Discovery. This book is, therefore, commended to those who are not unwilling to take a liberal view of the scope and relations of geography. R.S.W.

Quelques Problemes Concernant la Représentation de la Densité des Habitations Rurales. Edgar Kant. Lund Studies in Geography, Ser B. Human Geography, No. 2. 16·1 × 23·4 cm. 9 pp. Stockholm, Sweden: The Royal University of Lund, Sweden. 1950. N.P.

The author of this small monograph contends that a map showing the density of inhabited buildings is of more geographical value than one showing the density of population. He then compares different ways of constructing such a map, and illustrates them in the case of an Estonian island. This pamphlet should interest all concerned with methods of plotting population, especially in rural areas. The recommended method gives a fine result, and has this advantage, that it uses the map rather than the census. W.C.B.

Making Local Surveys: An Eye for Country. Charlotte A. Simpson. 22 × 14 cm. viii + 78 pp. London: Sir Isaac Pitman & Sons, Ltd. 1951. 10/6.

Professor Butterworth says in *The Origins of Modern Science* that authors who merely write about method are liable to mistakes which are avoided by those who are actually engaged in research. This criticism does not apply to Miss Simpson who is well known for her village surveys; she combines research with method, illustrating with map and photograph, the landscapes which she describes. Examples embrace all kinds of scenery—granitic, sandstone, limestone. She discusses dry valleys and flood plains, coasts and ice features. For through first-hand knowledge of such land forms comes an eye for country. The study of farms, markets, local industries and communications can help in the understanding of the site of a village or town. But a complete local survey should combine with observations of present conditions records of what happened in the past. Pre-historic camps and barrows; Roman, Saxon and medieval buildings; parish records and the study of architecture can all help to fill in the picture.

Some people think that surveys can be made only of country districts, but urban surveys are also considered in this book. When the surveyor looking at factories and dreary streets pieces together the evidence of site, street names, domestic architecture, local water supply, and old maps, a fascinating picture comes to life. Nor should the matter rest there; it should lead to a discussion of a future development plan.

A special feature of this delightful book is the list of problems and experiments with which each chapter is concluded. No one who works through them can fail to gain an eye for country. This book should be on the shelves of all schools and training colleges. E.M.C.

The Village Surveyed. Cecil Stewart. 15 × 23·5 cm. 171 pp. London: Edward Arnold & Co., Ltd. 1948. 12/6.

This is the story of a survey of and a plan for Sutton-at-Hone, which owes much to the stimulus given by Sir Stephen Tallents. The enquiry sprang from the conviction that villages have real needs which are neglected. The Leverhulme Trustees, recognising this need, made a grant to Mr. Cecil Stewart to carry out this survey in which help came not only from specialists and students but also from those who lived in the village itself. It began with a meeting in the village hall, and soon had the school children interested in the work and suggesting improvements. The survey included a review of physical features, transport facilities, soils, land utilisation and historic buildings. Later a house to house survey was made and housing types and public services were classified. Eventually a development plan was outlined.

When the work was complete another meeting of the villagers was convened, to see the maps and plans and to hear the analysis and diagnosis. Everyone filled in a questionnaire to say whether his own needs had been met by the plan In many respects the story of Sutton-at-Hone is a reminder of the survey of the 6,747 villages conducted by the National Federation of Women's Institutes. Both have voiced the needs of small minorities, but without them England would be very much poorer.

The reviewer suggests that *The Village Surveyed* makes a useful corollary to the methods and suggestions to be found in *Making Local Surveys* reviewed above. E.M.C.

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